



NOTES FROM THE DIRECTOR

No. 160

February 1985

NEW LABORATORY CHIEFS

Donald L. Keister was hired as Chief of the Nitrogen Fixation and Soybean Genetics Laboratory, PPHI, on October 14, 1984. Dr. Keister received his B.S. in Chemistry and Mathematics from West Virginia Wesleyan College and his M.S. and Ph.D. in Biochemistry from the University of Maryland in Baltimore. He held post-doctorate positions at Johns Hopkins University and the Research Institute for Advanced Study (Baltimore) prior to joining the Charles F. Kettering Research Laboratory in 1962. He has also concurrently been an associate faculty member at Antioch College and Wright State University. Dr. Keister is internationally known for his contributions to research in photosynthesis and symbiotic nitrogen fixation. He has held many NSF and USDA grants and has organized and participated widely in symposia on photobiology and on nitrogen fixation.

Donald D. Kaufman has been appointed Chief of the Soil-Microbial Systems Laboratory (formerly the Biological Waste Management and Organic Resources Laboratory), AEQI. The new laboratory mission encompasses basic research on many aspects of soil organic matter including microbial processes. Dr. Kaufman is a native of Ohio. He received his formal education at Kent State University and his Ph.D. in plant pathology at Ohio State University. He joined ARS at Beltsville in 1962 as the lead microbiologist of a newly established unit to study the fate and behavior of pesticides in soils. During the subsequent two decades, he has achieved a world-wide reputation as an authority on microbial degradation of pesticides. His most recent contribution was the recognition of a national problem with enhanced degradation of chemicals due to build up of degradative microbial populations. He has authored over 180 publications in his field.

LABORATORY NAME CHANGES

The Light and Plant Growth Laboratory has been changed to Plant Photobiology Laboratory.

The Tissue Culture and Molecular Genetics Laboratory name has been changed to Tissue Culture and Molecular Biology Laboratory.

NEW RESEARCH SCIENTISTS

Dante S. Zarlenga, Research Microbiologist, recently joined the Helminthic Diseases Laboratory, API, where he will conduct research directed toward the cloning of genes and expression of parasite antigens for use in diagnostic and vaccine development. Dr. Zarlenga received his Ph.D. in Chemistry from the University of Cincinnati in 1982. From 1982 to 1984 he was an NIH Postdoctoral Research Fellow in the Department of Biophysics at the Johns Hopkins University School of Public Health, where he investigated alterations in gene expression associated with the antiproliferative effects of interferon on human fibrosarcoma cells.

Eliot M. Herman has joined the Seed Research Laboratory, PGGI. He will establish a research program that relates bioregulatory mechanisms to intracellular membrane flow and differentiation. The overall objective is to understand the basic processes involved in the growth and development of seeds. Dr. Herman received a Ph.D. (Biology) from the University of California at San Diego. He was a Postdoctoral Research Fellow at California Institute of Technology and most recently an Assistant Research Biochemist at the University of California at Riverside.

RESEARCH PROGRESS

Insect molting hormones (ecdysteroids) - Several years ago, scientists at the Insect Physiology Laboratory, PPI, discovered that 26-hydroxyecdysone was the major molting hormone present during embryonic development of the tobacco hornworm, Manduca sexta. To date, this situation remains unique since the hornworm embryo is the only stage of any insect species in which 26-hydroxyecdysone is the major ecdysteroid. Recently, IPL scientists determined that nearly all ecdysteroids present in newly-laid Manduca eggs are conjugates. As embryonic development progresses, increasing amounts of these conjugates are hydrolyzed to provide the corresponding free ecdysteroids. Throughout embryonic development, 26-hydroxyecdysone constitutes over 90% of the ecdysteroids present both in the free and conjugated form.

A team of scientists including M. J. Thompson, G. F. Weirich, J. A. Svoboda, M. F. Feldlaufer, and K. R. Wilzer from the Insect Physiology Laboratory and H. H. Rees of the University of Liverpool, England, recently isolated the major conjugate in pure form, and by means of extensive physical and biochemical analyses, identified it as 26-hydroxyecdysone 26-phosphate. This discovery provides important new information toward our understanding of the basic biochemistry of insect molting hormones, and is of interest to many researchers using Manduca as an experimental tool in an effort to develop biorational pest control strategies based upon the selective disruption of the insect's hormonal system.

Biocontrol of bean rust - Rust caused by the fungal pathogen Uromyces appendiculatus is a major disease problem on snap and dry beans in the United States and worldwide. In the U.S. alone, estimated losses exceed a quarter billion dollars annually. U. appendiculatus is a highly variable pathogen with more than 40 races. Although resistance is available in bean germplasm, considerable effort is required to enhance this germplasm for controlling rust. Fungicides to control rust are used, but they are not always economically practical and the public in general is concerned about chemical pesticides. Hence, alternative control measures are being explored.

Earlier work in the Plant Pathology Laboratory, PPI, with Bacillus subtilis has shown that it has great potential for controlling bean rust under greenhouse conditions. Field experiments also were conducted in 1981 and 1982 on highly susceptible bean cultivars (Pinto III and Lake Shasta) which were exposed to compatible races of the pathogen. The results of those experiments showed that better than 75% rust control was obtained by using B. subtilis. In some cases, B. subtilis treatments were more effective than the synthetic fungicide recommended for control of bean rust. Purification and identification of the B. subtilis inhibitor and modification of the structure could improve its environmental stability and lead to a safer class of fungicides.

COMPETITIVE RESEARCH GRANTS

The two most recent Science Advisors to the President, Frank Press and George Keyworth, have strongly supported increased funding for the Competitive Research Grants Program within the U.S. Department of Agriculture. Ed Kendrick, who oversees the Competitive Research Grants Program in USDA, gave a seminar at Beltsville in December and pointed out that the level of funding for this program increased from \$17 million in FY 1984 to \$46 million in FY 1985.

ARS scientists received almost \$720 thousand in competitive grants in FY 1984. Thirty-nine proposals were submitted by ARS scientists and 11 were funded, representing a success rate of approximately 28%. This compared favorably with the success rate of other major categories of submitting organizations, which ranged between 25% and 29%.

Two FY 84 grants were made to the Beltsville Area. One was for \$45,000 for research on the structure and function of cucumovirus satellite-like RNA. The second grant for \$80,000 provides support for research on recombinant DNA and gene transfer system for Spiroplasma.

Terry Kinney, the ARS Administrator, has indicated that the Agency fully supports the concept of competitive grants as an adjunct to the ARS base program. Grants should be sought if they support our base program but not as an alternative. It is the policy of ARS to support competitive grants so long as ARS scientists can compete on an equal basis with scientists from other institutions.

Further information on deadlines and application procedures may be obtained by contacting the Science and Education Office of Grants and Program Systems at 475-5022.

SCHAEFFER RECEIVES ARS FELLOWSHIP

Gideon W. Schaeffer, Tissue Culture and Molecular Biology Laboratory, PPHI, recently received a \$12,000 ARS Fellowship to study at the Salk Institute in San Diego, California, for 6 months. He will work with Chris Lamb, a biochemist who is conducting research on the molecular genetics of phytoalexin responses in plants. Dr. Schaeffer is especially interested in expanding his expertise in molecular genetics and developing new analytical computer techniques for two-dimensional gel electrophoresis. Dr. Schaeffer will leave for San Diego on April 1.

The ARS Fellowship Program provides financial support to individuals selected to participate in a research or education program at an institution of their choice. The objective is to encourage highly-qualified employees to strengthen their skills in research areas targeted for increased emphasis in ARS. A committee reviews all applications for support and makes recommendations to the ARS Administrator, Dr. T. B. Kinney, Jr. For further information on the ARS Fellowship Program, contact Carlene Russ, Personnel Division, at 436-8158.

FOY ELECTED FELLOW

Charles D. Foy, Research Soil Scientist, Plant Stress Laboratory, PPHI, was elected as a Fellow by the American Society of Agronomy during the 76th Annual Meeting in November. He is one of 29 new Fellows. Dr. Foy is a leading

authority on the tolerance of plant species to mineral stress. He has collaborated with plant breeders around the world to tailor plants to fit adverse soil conditions that are not readily correctable with conventional technology. Dr. Foy is especially noted for his research on principles for screening plants for aluminum and manganese tolerance.

KNOX HONORED

David A. Knox, Bioenvironmental Bee Laboratory, PPI, was recently honored by the Apiary Inspectors of America with the Outstanding Service Award at their Annual Conference in San Antonio, Texas. Mr. Knox was recognized for his contributions in the diagnosis of bee diseases and research on their control. The plaque is inscribed, "In appreciation for valuable service to the beekeeping industry and the Apiary Inspectors of America," and was presented by I. Barton Smith, Jr., Maryland State Apiary Inspector and Secretary of the A.I.A.

SUGARCANE WORKSHOP

The Plant Pathology Laboratory hosted a workshop on sugarcane pathology at Beltsville on October 29-November 1, 1984. This workshop was sponsored by the International Society of Sugarcane Technologists to discuss methods for identification of specific races of pathogens and for rating germplasm against leaf scald, mosaic, and smut diseases. The workshop provided a forum for the largest meeting of cane pathologists ever held. There were 28 participants representing the U.S. as well as Australia, Barbados, Brazil, France, Guyana, Indonesia, Jamaica, Mauritius, South Africa, Taiwan, Thailand, Trinidad, and Zimbabwe. All participants felt that the workshop and their visit to BARC and the surrounding area were a success.

EMPLOYEE ACTIVITIES

D. F. Weber and H. H. Keyser, Nitrogen Fixation and Soybean Genetics Laboratory, have been appointed members of the Editorial Board of the New MIRCEN Journal of Applied Microbiology and Biotechnology. The Journal is sponsored by UNEP/UNESCO/ICRO.

Martin Jacobson, Chief, Biologically Active Natural Products Laboratory, AEQI, organized and chaired a symposium on "Chemistry of Native Plants Useful as Agricultural Pesticides in the Developing Countries" at the International Chemical Congress of Pacific Basin Societies, Honolulu, HI, December 1984. He also presented a paper entitled "Pesticidal Plants of Tropical Asia and Africa" at the Congress, and attended a meeting of the East-West Center Botanical Pest Control Board in Honolulu.

D. K. Hayes participated as a temporary advisor in an informal consultation convened by the World Health Organization on Disinsection of Vessels and Aircraft, one purpose of which was to revise recommendations for disinsecting of aircraft. Eleven temporary advisors from 10 countries, one representative of the International Civil Aviation Organization and 10 representatives of the World Health Organization participated in the informal consultation. The recommendations made by the group concerning aircraft disinsection are as follows: (1) maintain the recommendations on the procedure for "blocks away" spraying, (2) maintain the recommendation on the procedure for on the ground disinsection, and (3) add a recommendation for residual disinsection using a 2% permethrin spray.

Jack R. Coulson, Chief, Beneficial Insect Introduction Laboratory (BIIL), IIBIII, has been elected Vice President of the International Organization for Biological Control (IOBC), and in a separate election is also President-Elect of IOBC's North American Regional Section.

John J. Drea, BIIL, Research Entomologist, is currently serving as North American Editor of IOBC's journal *Entomophaga*.

Joseph F. Urban, Jr., Helminthic Diseases Laboratory, API, has been selected as a member of the Editorial Board of *Experimental Parasitology*. He recently returned from the 8th International Pig Veterinary Society Congress in Ghent, Belgium; and visited the Animal Physiology Institute in Babraham, England, and the Royal Veterinary and Agricultural University in Copenhagen, Denmark.

Robert Reynolds, Vitamin & Mineral Nutrition Laboratory, BHNRC, was invited to present a seminar at the Hoffmann-LaRoche in Basle, Switzerland, on December 5, 1984. He presented a review on the workshop on "Vitamin B-6 Nutrition and Metabolism - Its Role in Health and Disease" and also discussed future workshops.

Dr. Reynolds also visited the Childs Health Center in Warsaw, Poland. He reviewed the ongoing PL-ARS-99 cooperative research project entitled, "Nutritional Requirements for Intestinal Calcium and Phosphate Transport" with the principle investigator, Dr. Roman Lorenc. They also discussed potential areas of mutual interest for a new project.

Gary Beecher, Chief, Nutrient Composition Laboratory, BHNRC, was invited to attend a meeting of the National Livestock and Meat Board in Chicago, Illinois, on December 19, 1984. The meeting was to study carefully the proximate analysis, vitamin, mineral, and other similar laboratory data for the beef, pork, and lamb nutrient composition studies.

AWARDS

Cash Award

Jitender P. Dubey - Microbiologist, Protozoan Diseases Laboratory, API, (Merit Pay)

Rex L. Powell - Research Geneticist, ASI, (Merit Pay)

Norman J. Livsey - Biological Laboratory Technician, HSI, (For superior service and technical skill in the analysis of complex plant cell wall carbohydrates and proteins using a wide range of analytical techniques.)

Helen-Jean Talbott, Horticulturist, PGGI, (Developed and implemented a functioning, computerized plant inventory system for quarantined Solanum, Malus, Pyrus, and Prunus sp.. Demonstrated its use to other station personnel.)

Glenn W. Hanes, Chemist, AEQI, (For sustained high level technical support of the laboratory and significant contributions to increased productivity in the Minor Use Program (IR-4).)

David H. Clark, Biological Laboratory Technician, PPHI, (Increased initiative and independence in the performance of his job.)

Margaret J. Rogers, Secretary, PGGI, (Contributed to the successful reorganization of the main office, etc. of the Plant Introduction Station. Upgraded the filing system, organized and upgraded accounts files and accounting procedures, contributed significantly to an improved "work-place attitude" and to the general well-being of the station.)

Selma G. Horwitz, Technical Information Specialist, BHNRC, (For outstanding service to the scientists of the BHNRC by maintaining the highest standards in the Reference Room.)

Laura J. Wood, Biological Laboratory Technician, VMNL, BHNRC, (For performing a critical supportive role in the completion of a highly complex study of selenium pharmacokinetics in humans.)

Esther M. McGuire, Secretary, LNL, BHNRC, (For aiding Laboratory Chief in the recruitment of subjects for a human diet study while maintaining excellent performance of regular secretarial duties.)

Betty A. Perkins, Laboratory Worker, API, (For continuous outstanding performance as Laboratory Worker.)

Irene D. Franklin, Laboratory Worker, API, (For continuous outstanding performance as Laboratory Worker.)

Moses J. Bishop, Metal Photo Transferer, USNA, (For extensive interest and highly significant efforts in out-reach recruitment opportunities for minorities and disadvantaged.)

Donald R. Whitehead, Research Entomologist, SEL, IIBIII, (For exceptional performance in providing authoritative identifications and taxonomic information on weevil pests important to U.S. and foreign agriculture.)

Kenneth L. Glover, Animal Caretaker, API, (For continuous outstanding performance as Animal Caretaker.)

Quality Increase

Wendell H. Headley, Agricultural Research Technician Plants, PGGI, (For sustained high quality performance in managing equipment and research material for the Cereal Project and other projects in the greenhouse Range 3, BARC-West.)

Mark P. Richards, Research Animal Scientists, ASI, (Exemplary performance in the conduct of swine nutrition investigations to improve iron status of the neonatal pig.)

Harriet S. Gladish, Photographer, Photo Lab, (For outstanding performance of duties during the past year at the Photo Lab and for showing leadership and initiative in matters relating to finance and procurement with Eastman Kodak.)

Jeanette M. Baylor, Secretary, Visitors Unit, (Used resourcefulness, effort, and initiative to improve the effectiveness of the Visitors Unit.)

Patricia A. Espenshade, Computer Operator, IIBIII, (For long-term, sustained superior performance as Manager of the Computer System in the Insect Identification and Beneficial Insect Introduction Institute.)

Joanne M. Whitt, Biological Laboratory Technician, ASI, (For superior performance of duties and interest and dedication to research effort.)

VISITORS

Mr. Pat Dale, Officer in Charge, Plant Health Diagnostic Station, Ministry of Agriculture and Fisheries, Mt. Albert Research Centre, Auckland, New Zealand, visited the Livestock Insects Laboratory on December 11, 1984. He presented a seminar, "Aircraft Disinsection - The New Zealand Viewpoint." Mr. Dale is a proponent of use of residues as a major technique for control of hitchhiking insects.

Mr. Martin Frame from the Carl Duisberg Society, Inc., which represents the United Nations International Development Organization (UNIDO) in the United States, visited the Livestock Insects Laboratory on December 10, 1984, to discuss placement of UNIDO fellows with the laboratory. At present, the laboratory has one fellow, R. P. Luthra, and anticipates another fellow, P. G. Shuikla, (both from India) will arrive in January to study controlled release of pesticides.

Dr. Morris Soller, Department of Genetics, Hebrew University of Jerusalem, Israel, visited with Rex L. Powell, Animal Improvement Programs Laboratory, and discussed application of biotechnology to increasing accuracy of dairy sire selection. Dr. Soller also presented a seminar "Restriction Fragment Length Polymorphisms in Animal Genetic Improvement" on December 12, 1984.

Dr. Richard Sackman from Maharashtra, India, visited the Animal Improvement Programs Laboratory (AIPL) on January 3, 1985. Dr. Sackman sought advice from Frank N. Dickison and H. Duane Norman of AIPL on genetic improvement strategies for increasing yield and transmitting ability of native and crossbred dairy cattle in Maharashtra province.

Waldemar Klassen

WALDEMAR KLASSEN

Director

Beltsville Area



NOTES FROM THE DIRECTOR

No. 161

March 1985

BUDGET OUTLOOK

Secretary John Block officially released the proposed 1986 budget for the U.S. Department of Agriculture on February 4, 1985. The budget includes \$5.5 million of new program increases for the Agricultural Research Service. The Beltsville Area is targeted to receive increases of \$907 thousand for new research on groundwater quality, technologies for soil and water resource inventories, germplasm evaluation and enhancement, and research on animal health in support of action agencies. The new budget also proposes a five percent pay reduction for Federal employees. In these times of fiscal austerity, ARS is maintaining a fixed budget while other USDA agencies are scheduled to absorb substantial reductions. Congressional hearings on the proposed ARS budget are scheduled for the middle of March.

HEALTH AND FITNESS CENTER DEDICATED

Terry B. Kinney, Jr., Administrator of ARS, dedicated a new ARS Health and Fitness Center at Beltsville on February 26, 1985. The Center includes stationary bicycles, rowing machines, aerobic rebounders, single station weight machines, dumbbells, situp boards, and exercise mats. There are men's and women's dressing areas but no showers as yet (bathroom facilities are available). Shower facilities are currently in the design stage.

The Center provides invigorating classes designed to improve your flexibility, endurance, and ability. It combines calisthenic-type exercises for body toning; stretching movements for improved flexibility; and light aerobics for your cardiovascular system. The benefits of participating in these programs include improved productivity and quality of life.

The new Center is located in Building 010, BARC-West, the site of the former employee cafeteria. The hours of operation are from 7:00 a.m. to 7:00 p.m., Monday to Friday. For further information on the program and classes, call 344-1871.

LABORATORY REALIGNMENTS

An Insect Chemical Ecology Laboratory has been established in the Agricultural Environmental Quality Institute. This new laboratory was created by merging the Organic Chemical Synthesis Laboratory and the Biologically Active Natural Products Laboratory. Richard Ridgway will serve as Chief of the new unit.

The Chemical Coordination Unit, AEQI, has been merged with the Pesticide Impact Assessment Staff, AEQI. The combined units will now be known as the Pesticide Assessment Laboratory. Ron Davis is serving as Acting Laboratory Chief while Stan Fertig is on detail to the Foreign Agricultural Service.

Approval has been received to establish a Plant Molecular Genetics Laboratory in the Plant Genetics and Germplasm Institute. The new laboratory will focus on identifying, isolating, and characterizing the genes that control the growth and quality attributes of plants and plant products. Special emphasis initially will be given to using molecular markers to map the chromosomes of soybean and to the genetic control of the synthesis of proteins in soybean. The new laboratory will be located in Building 006.

RESEARCH PROGRESS

Characterization of bovine immunoglobulins - Antibodies are complex proteins, produced in all animals, that recognize disease causing substances and neutralize them, thus protecting the body against disease. A great deal of research has been conducted to determine how antibodies perform their protective function. These efforts, however, have been hampered by a lack of pure antibody to specified substances, because the animal produces antibodies to a variety of substances simultaneously. Due to their similar structure and function, these antibodies are virtually impossible to isolate in pure form.

Recent technology makes it possible now to isolate a single cell, which produces only one type of antibody, and propagate that cell in tissue culture to produce large quantities of pure antibody. Scientists in the Animal Science Institute have collaborated with colleagues at Amherst College to propagate a cell line that is especially unique. The cell line is the result of the first successful fusion of cow blood cells with a mouse cell line resulting in a hybrid cell line that produces cow antibodies. These cow x mouse cells are being kept frozen for future use in the production of pure antibody for indepth studies on antibody production and function in the cow.

Protective immunity in pigs - *Ascaris suum* is the parasitic intestinal roundworm of swine. During its life cycle, it migrates through several body organs, including the lungs and liver, causing extensive tissue damage. Losses due to this major parasite in swine in 1976 were estimated at \$100 million per year. This figure was based on the cost of increased feed required by the farmer to produce a market weight hog, the cost of drug treatment to reduce parasite load, and the dollar loss due to liver condemnations. Even with recent moves toward confinement rearing of swine, current surveys indicate that *A. suum* infection is still a major economic concern because of the ubiquity and resistance of this parasite in the environment.

Procedures for vaccination against *A. suum* are not available. The development of such a vaccine would provide immediate and significant benefits to the swine industry. Current studies in the Helminthic Diseases Laboratory, API, are designed to provide a solution to this problem. API scientists recently have demonstrated that certain products derived from the parasite can protect pigs from infection after vaccination. Their results provide a basis for further studies designed to isolate specific parasite products and enhance the efficiency of the vaccination procedure.

Molting hormone of bee pupae. The 28-carbon steroid, makisterone A, has been isolated and identified as the major molting hormone (ecdysteroid) of honey bee pupae at the time of peak hormone titer by a team of scientists including M. F. Feldlaufer, J. A. Svoboda, M. J. Thompson, and W. R. Lusby from the Insect Physiology Laboratory, PPI, and E. W. Herbert, Jr., Bioenvironmental Bee

Laboratory, PPI. This is the first identification of this ecdysteroid in the order Hymenoptera, although it has been previously reported to occur in several species of Hemiptera. All other insects studied to date, however, biosynthesize 27-carbon molting hormones exclusively.

The discovery of makisterone A as the major molting hormone in bee pupae reflects an adaptation of the honey bee to utilize a 28-carbon dietary sterol as the precursor for its molting hormones. Unlike most phytophagous insect species, the honey bee, which evolved from predaceous ancestors, cannot convert 28- and 29-carbon phytosterols to cholesterol--the precursor for the most common 27-carbon molting hormones such as ecdysone and 20-hydroxyecdysone. This basic information on insect steroid biochemistry is providing important insight into the phylogenetic relationships between certain insect species with regard to sterol utilization. Such knowledge may be extremely useful in the development of new selective pest control strategies based on inherent biochemical differences between beneficial and harmful insects and other organisms.

Sucrose movement in sugar beets - Crop yields could be significantly increased if we better understood the mechanism by which plants partition photosynthetic products (sugars) between different parts of the plant. Scientists now believe that plant hormones may control sugar movement within plants. Results of recent studies in the Plant Hormone Laboratory, PPHI, show for the first time that the plant hormone ethylene can stimulate sugar uptake for storage in an economically important plant organ, the sugar beet root. This finding strongly supports the idea that plant hormones can direct sugar transport into the economically important parts of crop plants.

Rapid, reliable pathogenicity test - Bacterial leaf spot is a serious disease in the production of peaches, apricots, plums, and cherries and is caused by host specific pathovars of Xanthomonas campestris. The pathogen is identified by its ability to cause disease in its hosts. Existing tests to identify pathogenicity of the prunus bacterial spot disease pathovars are inadequate, laborious, and unreproducible. Scientists in the Fruit Laboratory, HSI, recently developed a simple, rapid, and reliable pathogenicity test using detached peach leaves. The pathogen is infiltrated into leaves and the leaves are incubated on water agar. Well defined symptoms develop in 14 days. The test is highly specific and has successfully distinguished field resistance of 21 of 22 cultivars. The test can be modified and used to study microbial interactions on leaves with a view to identifying a biological control agent against this disease.

NEW SCIENTISTS

Bruce D. Whitaker, Plant Physiologist, has joined the Horticultural Crops Quality Laboratory, HSI. He will investigate the biochemical and biophysical changes of membranes during softening and senescence and during chilling stress. The objective of the program is to elucidate the mechanisms involved and understand their significance in regulating the quality of harvested fresh fruits and vegetables. Dr. Whitaker obtained his Ph.D. in Plant Physiology at the Department of Energy Plant Research Laboratory, Michigan State University. He has held postdoctoral research appointments at the Smithsonian Institution Radiation Biology Laboratory and the Department of Biochemistry, University of Wisconsin.

EMPLOYEE ACTIVITIES

William Moats, Meat Science Research Laboratory, ASI, co-organized and co-chaired a symposium on "Physical-chemical methods for determination of antibiotic residues in tissues and milk of food-producing animals" at the Centennial Meeting of the Association of Official Analytical Chemists, November 1984, Washington, D.C. He also presented a paper entitled "Chromatographic methods for determination of macrolide antibiotic residues in milk and tissues of food-producing animals."

Thomas E. Devine, Nitrogen Fixation and Soybean Genetics Laboratory, PPHI, has received a travel grant from the International Institute for Advanced Studies in Caracas, Venezuela. The Institute invited Dr. Devine to present a lecture on "Biotechnology for Nitrogen Fixation" in a course titled "Advanced Course in Cell Culture and Plant Improvement." Dr. Devine will provide formal and informal instruction to international participants and will engage in discussions with other distinguished lecturers during a 2-week period in Caracas.

Lloyd Knutson, Chairman, Insect Identification and Beneficial Insect Introduction Institute, has been elected President-elect of the American Registry of Professional Entomologists (ARPE) for 1985-86. Dr. Knutson will succeed Sidney E. Kunz, Research Leader at the USDA Livestock Insects Research Laboratory, Kerrville, Texas, as president. ARPE is chartered by the Entomological Society of America and includes over 1800 members nationwide. ARPE's main role is in certifying and maintaining a register of professional entomologists. The Registry is involved in a broad range of activities in public information, continuing education, and many other areas where entomology has direct contact with public users of entomological expertise.

Harold F. Winters, former Research Horticulturist and Chief, Germplasm Resources Laboratory, PGGI, was awarded the Frank N. Meyer Memorial Medal at the 1984 annual meeting of the Crop Science Society of America. The presentation was made for his outstanding achievements in the field of plant exploration. The medal commemorates Frank N. Meyer's contribution to America's economic horticulture and his service in the field of foreign plant introduction as an agricultural explorer for the Department.

Helene N. Guttman, Office of the Director, BHNRC, has been elected as a Member of the American College of Sports Medicine in the United States.

Orville Levander and Claude Veillon, Vitamin and Mineral Nutrition Laboratory, BHNRC, were invited to speak at the Second Conference for Federally-supported Human Nutrition Research Units and Centers sponsored by the Interagency Committee on Human Nutrition in Chevy Chase, Maryland, on January 14-15, 1985. Dr. Levander's speech was entitled, "Use of stable selenium isotope (^{70}Se) to investigate selenium metabolism in pregnant women." Dr. Veillon spoke on, "Use of stable isotopes to monitor kinetics of selenium excretion in New Zealand women before and after selenium supplementation."

Joseph T. Vanderslice and Darla J. Higgs, Nutrient Composition Laboratory, BHNRC, have discovered a new chromatographie method for the determination of Vitamin C in food. It was published in the Journal of Chromatographie Science, December 1984.

AWARDS

Cash Award

James A. Ward, Motor Vehicle Operator, USNA, (For outstanding performance in providing sustained efficient and prompt execution of his daily tasks in a constant professional manner.)

Marcia L. Rhoads, Research Chemist, Helminthic Diseases Lab, API, (For superior achievement in the isolation of cysticercosis antigen and its application to the development of a serological test for bovine cysticercosis.)

Theodor O. Diener, Research Plant Pathologist, Plant Virology Lab, PPI, (Invention award for issuance of U.S. Patent 4,480,040 - Title: Sensitive and rapid diagnosis of viroid diseases and viruses.)

Robert A. Owens, Research Chemist, Plant Virology Lab, PPI, (Invention award for issuance of U.S. Patent 4,480,040 - Title: Sensitive and rapid diagnosis of viroid diseases and viruses.)

Jerome A. Klun, Research Entomologist, Insect Chemical Ecology Lab, AEQI, (Invention award for issuance of U.S. Patent 4,474,755 - Title: Bagworm moth attractant and plant protectant.)

Meyer Schwarz, Research Chemist, Insect Chemical Ecology Lab, AEQI, (Invention award for issuance of U.S. Patent 4,474,755 - Title: Bagworm moth attractant and plant protectant.)

Charles Harding, Physical Science Technician, Insect Chemical Ecology Lab, AEQI, (For superior performance in professional training of a Foreign Research Associate and a gifted student, exceeding job requirements.)

Quality Increase

Sara L. Reynolds, Microbiologist, Plant Pathology Lab, PPI, (For superior performance of isolation, purification and microbiological assays essential for the study of soybean pathogens and Rhizobium.)

Judy Adams, Secretary, Meat Science Research Lab, ASI, (For sustained superior performance as a secretary-typist in providing administrative and secretarial support to the Meat Science Research Laboratory which aided in the achievements of the laboratory.)

Daniel Scholfield, Biological Lab Technician, Carbohydrate Nutrition Lab, BHNRC, (For sustained superior performance of duties related to biochemical, statistical and sample analyses from experiments conducted at the Beltsville Human Nutrition Research Center.)

VISITORS

Dr. Frederick Baudais from the Bomen Corporation of Ottawa, Ontario, Canada, visited with Gary Beecher of the Nutrient Composition Laboratory in December to discuss laboratory instrumentation.

Dr. Jussi Huttunen from the National Public Health Institute of Helsinki, Finland, visited with Gary Beecher and Wayne Wolf of the Nutrient Composition Laboratory in December to discuss carotenoid and selenium analysis of food.

Dr. Sofus Klausen from the Agder College of Kristiansand, Norway, visited with Gary Beecher in January on laboratory instrumentation.

Dr. R. J. Boisvenue of Eli Lilly and Denes Suhayda of Merck, Sharp and Dohme, visited Frank Douvres at the Animal Parasitology Institute for extensive training on helminth cultivation. These two major pharmaceutical companies plan to establish in vitro cultivation laboratories for drug screening and biological studies of livestock nematodes based on Dr. Douvres' methodology.

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NOTES FROM THE DIRECTOR

No. 162

May 1985

BELTSVILLE SCIENTISTS AWARDED SEVEN ARS RESEARCH ASSOCIATES

Terry B. Kinney, Jr., Administrator of ARS, has approved 50 new ARS Research Associate proposals for 1985. The Administrator will fund each of these proposals for 12 months, with the option of extending each appointment for up to 2 years if warranted and if second-year funding is available within Area budgets.

Seven Beltsville Area proposals were selected for funding:

Developmental regulation of gene activity in Glycine species using gene transfer - L. Vodkin, PGGI

Molecular cloning of a gene encoding an enzyme that detoxifies methycarbamate pesticides - J. Karns and P. Kearney, AEQI

Use of monoclonal antibodies to detect genetic markers of disease resistance - M. Paape, ASI

Molecular aspects of the herbicide receptor, 32kDa membrane protein attuned to its function in photosynthesis - A. Mattoo, PPHI

Control of prenatal sex ratio through the isolation of X- and Y-chromosome-bearing spermatozoa - L. Johnson, ASI

Molecular cloning of a key regulatory enzyme in fruit ripening - A. Mattoo and J. Anderson, PPHI

Molecular cloning and expression of genes from Eimeria DNA libraries - J. Dame, API

ARS recently received special appointing authority to move quickly to hire outstanding candidates to these Research Associate positions. Appointments to these temporary positions can be made without going through the normal competitive hiring process. Associates must be on board by January 31, 1986.

Congratulations to the research scientists whose proposals will be funded.

RESEARCH PROGRESS

New Advances Against Coccidiosis - USDA Secretary John Block held a press conference in March to announce some promising new developments toward the goal of developing a vaccine against coccidiosis, a disease of poultry and livestock costing the poultry industry alone about \$300 million per year. In cooperation with Genex Corporation, ARS scientists Harry Danforth and Patricia Augustine, Protozoan Diseases Laboratory, API, developed monoclonal antibodies, genetically engineered a parasite protein, and used the protein to partially protect chickens from experimentally induced coccidiosis.

These results represent a major development in producing immunity against coccidiosis. First, they show that coccidial antigen can be genetically engineered. Second, they demonstrate that the bird will recognize this antigen as a foreign protein and develop specific antibodies that can be demonstrated by several methods. Most importantly, this is the first time that protection against coccidiosis has been induced by any method except by an actual infection. These results are preliminary. Further tests will be required to determine if protection can be made complete, if the same approach is efficacious for other species of coccidia, and to establish the best means of giving the antigen. Additional work will be needed before the ultimate objective of developing a practical vaccine against coccidiosis will be reached. Nevertheless, these results represent an important milestone in progress towards nonchemical control of this important agricultural parasite.

Serological Tests for Swine Trichinosis - The recent advances in the production of Trichinella spiralis antigen and its application to testing by ELISA procedures reported from the Helminthic Diseases Laboratory, API, and the Microbiology and Pathology Department, Food Safety and Inspection Service, have stimulated considerable interest in commercial application by private biological companies. Technical representatives from Agritech, Inc., Portland, Maine, and Ideteck, Inc., San Bruno, California, have spent several days at Beltsville working with H. R. Gamble and K. D. Murrell on the production of antigen and performance of the ELISA. In addition, these ARS scientists are supplying protocols, sera, and reagents to Applied Polytechnologies, Inc., Houston, Texas, and Innovative Technology, Inc., Hattiesburg, Mississippi, for their own development of a serological test for trichinosis. Research in the Helminthic Diseases Laboratory is continuing in an effort to produce the important diagnostic antigens by genetic engineering methods. This work is being led by Dante Zarlenga. These antigens are being evaluated for their efficacy as a vaccine for swine.

Genes Governing the Bovine Secretory Immune System - Mastitis costs dairy farmers more than \$2 billion dollars annually. Mastitis is caused by an invasion of the mammary gland by bacteria which thrive due to the abundant nutrients and optimum temperature. Antibiotics and chemicals are currently used to prevent infection and to cure established cases of mastitis. This results in losses due to the necessity to discard adulterated milk and to the cost of the treatment itself. A. J. Guidry, Milk Secretion and Mastitis Laboratory, ASI, is studying the natural defense mechanisms within the mammary gland to develop ways to increase their effectiveness (i.e., immunization) or to determine criteria to select cows with more efficient defense systems. His research seeks to determine the gene(s) governing antibody synthesis and secretion by bovine lymphocytes. He has found that the gene(s) are located on chromosome #3. This is the first data to be reported on chromosome mapping of genes governing the bovine secretory immune system. It is the first step toward breeding for increased antibody production in the bovine.

This research is cooperative with scientists at Utah State University, Amherst College, and the University of Nebraska.

Regulatory Controls on Viral Replication - A viral satellite is a small RNA molecule that is dependent upon a "helper" virus for its own multiplication. It at the same time often interferes in an unknown way with the replication (multiplication) of its helper virus. Understanding the mechanism of that interference could have important implications in the control of viral disease. A recent study in the Plant Virology Laboratory, PPI, examined certain structural features, the terminal nucleotide sequences, of the replicative forms of both cucumber mosaic virus (CMV) and its satellite CARNA 5 in search of clues to the interaction of the two within plant tissues. C. W. Collmer and J. M. Kaper found that the replicative forms of both viral and satellite RNAs have certain structural features in common which suggest that they use the viral replicative machinery competitively. At the same time, certain distinctive structural differences were found that could explain why CMV satellites usually outcompete viral replication and thereby suppress virus-induced symptoms.

A model was proposed for CMV replication that could explain why the above structural differences would allow CARNA 5 to escape from the normal regulatory controls on viral replication. This model will guide further experimentation on CARNA 5's structure in relation to its competitive replication and its ability to suppress CMV disease.

Plasmid DNA in *Bacillus thuringiensis* - The insect toxin produced by the bacterium *Bacillus thuringiensis* is one of the important materials used to control insects. The genes controlling production of this toxin are believed to be located in extrachromosomal plasmids in the bacterial cell. Reports of plasmid DNA content in *Bacillus thuringiensis* have been confusing owing to the difficulty of consistent lysis and recovery of the plasmids without loss or destruction. Scientists in the Insect Pathology Laboratory, PPI, have developed a procedure that not only provides for a simple screening method for consistently detecting small to giant plasmids in *Bacillus thuringiensis*, but also provides a relatively large-volume stable lysate containing intact plasmids useful for restriction enzyme mapping and cloning procedures. Application to a number of *Bacillus thuringiensis* serovars resulted in the identification of additional plasmids theretofore undetected. In ecological and genetic studies, this efficient screening procedure will also permit examination of a large number of strains and new isolates as they become available.

Copper Deficiency in Humans - In animals and humans, low-copper diets produce several deleterious effects. Exactly how this is brought about (mechanism) is not clearly understood. In animals, where severe copper deficiency can be produced, copper status is assessed by measuring ceruloplasmin (a substance which binds copper) activity in serum and superoxide dismutase (an enzyme which is dependent on copper for its activity) in red blood cells and other tissues. In humans, where copper deficiency is only mild, these parameters are not significantly altered, i.e., they are not good markers for copper status in humans. Since experiments with animals suggest a link between copper metabolism and endogenous opiates (morphin-like substances), scientists in the Carbohydrate Nutrition Laboratory, BHNRC, planned studies to measure opiates in plasma of humans fed a low-copper diet. Twenty-four healthy normal subjects were fed a

low-copper diet for 11 weeks. They were then replenished with high levels of copper for 3 weeks by giving them centrum (a multi-vitamin and mineral formula). Feeding low-copper diet increased the levels of β -endorphin (an opiate) in plasma and at the same time decreased significantly the levels of enkephalin (another kind of opiate) in plasma. These results suggest that plasma levels of enkephalin can be used as a marker of copper status in humans.

SEL RECEIVES CALIFORNIA COLLECTION

The California Department of Food and Agriculture recently donated an important collection of reference specimens to the Systematic Entomology Laboratory (SEL), IIBIII. The collection consists of 600 specimens of larval and adult sap beetles (Nitidulidae), with 38 species represented. Sap beetles, in both larval and adult stages, are important pests of dried and ripe fruits and are frequently found as contaminants in canned and processed fruit products. One species is implicated in the spread of oak wilt by its feeding on tree sap exudate. This donation represents a valuable addition to the SEL collections.

HILL RECEIVES MERITORIOUS SERVICE AWARD

Kenneth R. Hill, Chief, Analytical Chemistry Laboratory, AEQI, received the first IR-4 Meritorious Service Award from the Interregional Research Project No. 4 at their annual spring meeting in Pentagon City, VA. Dr. Hill was recognized with a plaque for "outstanding leadership and dedication to the IR-4 Program and the development of residue data to help support the registration of minor use pesticides."

WORKSHOP ON SENSOR TECHNOLOGY

A workshop was held at Beltsville in March to determine the research needed to close critical gaps in sensors and control systems technology. Applications of direct sensing and control have lagged partly because of a lack of basic information concerning what can and should be measured to provide a signal that can be utilized by computers or simple electronic hardware.

Participants identified approximately 35 specific objectives, 100 critical blocks that prevent achieving the objectives, and 200 researchable questions that must be answered to remove the blocks. The objectives are those in the agricultural production, processing, and distribution system that will increase overall effectiveness and efficiency. While some sensor research exists at Beltsville, a more concentrated effort is anticipated in the next several years under the direction of Dr. G. E. Vanden Berg. The findings of the workshop participants will be available to Federal, State, and private sector research administrators and researchers.

VISITING SCIENTIST

Myra K. Dunlop arrived in February to begin 1 year of postdoctoral studies on the isolation and characterization of microbial enzymes involved in the degradation of pesticides. Dr. Dunlop, a native of Scotland, received a B.Sc. degree in botany from the University of Manchester in 1979 and a Ph.D. in

genetics from the University of Leeds in 1982. She comes to Beltsville after 2 years of postdoctoral research on the enzymology of nitrate reduction in fungi at the University of Virginia. She will be working with Jeffrey S. Karns and Philip C. Kearney of the Pesticide Degradation Laboratory, AEQI.

Nevio Nuernberg, Soil Scientist at the Lages Experiment Station, Santa Catarina, Brazil, is spending 3 months at Beltsville. He is collaborating with Charles D. Foy of the Plant Stress Laboratory and with James Elgin and Jack Murray of the Field Crops Laboratory in developing methods to screen forage legumes and grasses for tolerance to excess aluminum in acid soils.

EMPLOYEE ACTIVITIES

Norman J. Stern, Research Microbiologist, Meat Science Research Laboratory, ASI, was invited to continue on the Editorial Board of the Journal of Food Protection; was recently elected as Secretary of the Campylobacter Society, an international association of scientists studying the epidemiology and pathology of this newly recognized disease; was invited to present a seminar at Norwich-Eaton Pharmaceuticals in Norwich, New York, on the pathology and detection of Campylobacter; and was requested by OICD to serve as Cooperating Scientist in a Pakistani SFC Research Grant, "Role of cations in the pathogenesis of Campylobacter."

J. P. Dubey of the Protozoan Diseases Laboratory, API, has been appointed to the Editorial Board of the International Goat and Sheep Research Journal.

George C. Steyskal (retired), Systematic Entomology Laboratory, IIBIII, has been named editor of Entomological Review. This journal is the English-language version of the USSR Academy of Sciences' Entomologicheskoye Obozreniye, which is the foremost Soviet periodical in the field of entomology. Mr. Steyskal not only edits all translations for the journal, but translates many of the articles. Mr. C.F.W. Mueseback, also a former SEL scientist, was editor of Entomological Review for many years.

Gary Beecher, Nutrient Composition Laboratory, BHNRC, presented a paper entitled, "The critical evaluation of nutrient data - A prerequisite of generating new data," at the INFOODS Users and Needs Conference held at Utah State University in Logan, Utah, in March.

Joseph T. Judd and Padmanabhan P. Nair, Lipid Nutrition Laboratory, BHNRC, were invited to Virginia Polytech Institute (VPI) to attend a meeting on procedures for mutagen assays. This meeting was designed to help Drs. Judd and Nair in their on-going diet study.

Mary W. Marshall, Lipid Nutrition Laboratory, BHNRC, was the invited featured speaker at the 2nd Annual Career Day Activities for the Nutrition Month Activities at the University of Maryland, Eastern Shore, Princess Anne, Maryland. She also served as a resource person to the Foods and Nutrition Career Awareness Workshop. Her speech was entitled, "Nutrition, Blacks and the Killer Diseases."

Norberta W. Schoene, Lipid Nutrition Laboratory, visited the National Public Health Institute in Jyväskylä, Finland, March 25-30, to collaborate in a study with Professor H. Arvilommi. They assessed arachidonic acid metabolism and platelet function in humans receiving selenium and placebo supplements.

EXPLORER POST ESTABLISHED AT BELTSVILLE

A new Explorer Post sponsored by the Agricultural Research Center in Beltsville had a successful opening night on Tuesday, March 19, 1985. This Post will concentrate on the range of career opportunities in science. Committee members responsible for establishing the new Post are: Gordon Carpenter, Graham Purchase, Evelyn Myers, Larry Douglass, Phyllis Martin, James Vaughn, Herschel Klueter, and John Taylor. Students between the ages of 14 and 20 with an interest in science are invited to join. Meetings will be held every third Tuesday. For further information, please call Gordon Carpenter (344-2483-days or 937-7510-evenings) or Evelyn Myers (344-2667-days or 572-4743-evenings).

AWARDS

Cash Awards

Elisa Beth Haransky, Biological Lab Technician, Insect Pathology Laboratory, PPI, (As a result of exceptional interest and dedication to her job recognized a new technique directly applicable to the research needs of the laboratory with considerable savings in time and money.)

Delores E. Sessions, Secretary, Plant Hormone Laboratory, PPHI, (For dedicated, outstanding secretarial and administrative support to the Plant Hormone Laboratory.)

Rebecca B. Dooley, Secretary, Engineering & Planning Branch, DO, (For outstanding clerical support during the preparation of a larger than normal fiscal year-end contract document workload.)

Edward M. Dougherty, Research Entomologist, Insect Pathology Laboratory, PPI, (For initiation and organization of bulk purchasing and storage of disposable lab ware resulting in decreased interruptions of research programs and substantial saving of research dollars.)

Thomas B. Jacobs, Jr., Biological Lab Technician, Ruminant Nutrition Laboratory, ASI, (For performance substantially beyond expectations in the conduct of intensive animal experimentation and analytical procedures.)

John W. Neal, Research Entomologist, Florist and Nursery Crops Laboratory, HSI, (Invention award for issuance of U.S. Patent 4,474,755 - Title: Bagworm moth attractant and plant protectant.)

Barbara A. Leonhardt, Research Chemist, Insect Chemical Ecology Laboratory, AEQI, (Invention award for issuance of U.S. Patent 4,474,755 - Title: Bagworm moth attractant and plant protectant.)

John G. Gordon, Foreman, Sheet Metal Shop, DO, (Outstanding performance of assigned duties as the Foreman, Sheet Metal Shop of the Maintenance & Construction Branch.)

George L. Eastep, Animal Caretaker, AO, (For the sustained work performance in care, feeding, semen collection and artificial insemination of the poultry flocks of physiology and nutrition studies.)

Jan Kochansky, Research Chemist, Insect Physiology Laboratory, PPI, (Invention award for issuance of U.S. Patent 4,464,390, Title: Control of parasitic mites with alkyl carbamates.)

Beverly Clevidence, Nutritionist, Lipid Nutrition Laboratory, BHNRC, (For outstanding performance in investigations of essential fatty acids in diets by gas liquid chromatography.)

Mary E. Dailey, Clerk-typist, Soilborne Diseases Laboratory, (For sustained highly competent and dependable performance in a critical period during which the lab had no secretarial help.)

George C. Papavizas, Chief, Soilborne Diseases Laboratory, PPI, (Invention award for issuance of U.S. Patent 4,489,161, Title: Strain of Trichoderma viride to control fusarium wilt.)

Christian F. Thompson, Research Entomologist, Systematic Entomology Laboratory, IIBIII, (For exceptional contribution to the overall Systematic Entomology Laboratory and Institute programs in computerization of systematics and related information.)

Charles S. Helling, Soil Scientist, Pesticide Degradation Laboratory, AEQI, (Initial Invention Award for U.S. Patent Application Serial No. 637,241, Title: Soil sampling apparatus.)

Terrence P. McGovern, Research Chemist, Organic Chemical Synthesis Laboratory, AEQI, (Initial Invention Award for filing U.S. Patent Application Serial No. 625,329, Title: Cockroach repellents.)

Terrence P. McGovern, Research Chemist, Organic Chemical Synthesis Laboratory, AEQI, (Invention Award for issuance of U.S. Patent 4,416,881, Title: Insect repellents employing cyclohexane-carbonyl morpholine compounds.)

Terrence P. McGovern, Research Chemist, Organic Chemical Synthesis Laboratory, AEQI, (Initial Invention Award for filing U.S. Patent Application Serial No. 625,328, Title: Insect repellents.)

Terrence P. McGovern, Research Chemist, Organic Chemical Synthesis Laboratory, AEQI, (Initial Invention Award for filing U.S. Patent Application Serial No. 625,266, Title: Cockroach repellents.)

Mary A. Brocker, Secretary, API, (For continued outstanding performance in managing and administering the office for the Animal Parasitology Institute resulting in a high level of efficiency and productivity.)

Ronald E. Billhimer, Animal Caretaker, API, (For continuous outstanding performance as Animal Caretaker.)

Kenneth D. Murrell, Supervisory Zoologist, Helminthic Diseases Laboratory, API, (Initial Invention Award for filing U.S. Patent Application Serial No. 683,284, Title: Diagnostic reagent for swine trichinosis.)

Howard R. Gamble, Zoologist, Helminthic Diseases Laboratory, API, (Initial Invention Award for filing U.S. Patent Application Serial No. 683,284, Title: "Diagnostic reagent for swine trichinosis.)

Preston A.ENZIAN, Tractor Operator, Farm Management Branch, (Outstanding performance of assigned duties in the Research Plots Section of the Farm Management Branch.)

Louis S. Welker, Chief, Engineering and Planning Branch, (For superior accomplishments in the Beltsville Area construction and energy retrofit program.)

Quality Increase

Vernon Wayne Smoot, Poultry Scientist, AO, (For exemplary performance in the management of a research hatchery.)

Roger D. Stone, Microbiologist, Insect Pathology Laboratory, PPI, (For exceptional performance in the support of tissue culture research and in the maintenance of valuable cell strains for the Insect Pathology Laboratory.)

LaVonne B. Thaden, Secretary, Insect Pathology Laboratory, PPI, (In recognition of sustained superior performance in her position and exceptional administrative support to the Laboratory Chief and other scientists of the Insect Pathology Laboratory.)

Shirley L. Freeland, Secretary, Database Management Unit/GRIN, PGGI, (For outstanding assistance to the Database Management Unit, Germplasm Resources Information Network.)

Nancy J. Bailey, Editorial Assistant Typing, Family Economics Research Group, (For sustained and high quality support in the preparation of Family Economics Review and other responsibilities.)

Certificate of Appreciation

Maxwell M. Crystal, Livestock Insects Laboratory, AEQI, (Development for the first time of methodology for membrane feeding and for staging and sexing of the northern fowl mite.)

SAFETY NOTE

Certain research plots, orchards, and greenhouses must be sprayed periodically to control pests. As a safety precaution, signs or notices are posted when it is desirable to exclude pedestrians from these areas. There have been several instances when people have been observed walking or jogging through posted areas. You are strongly urged to observe the precautions posted in our orchards, research plots, and greenhouses. If you have questions about any of the research areas, you may contact the Farm Management Branch at 344-3562.

Waldemar Klassen

WALDEMAR KLASSEN
Director
Beltsville Area



NOTES FROM THE DIRECTOR

No. 163

July 1985

DEPUTY SECRETARY VISITS BELTSVILLE

Deputy Secretary of the U.S. Department of Agriculture, John R. Norton, visited Beltsville on July 25. He was accompanied by Dr. Terry B. Kinney, Jr., Administrator of ARS. After an initial briefing on the organization and mission of ARS, the Deputy Secretary was shown some examples of research in the Beltsville Area. Programs highlighted included the National Plant Germplasm System, tissue culture for improving fruit crops, protecting groundwater quality, current thrusts in human nutrition, and research on marketing and exports of agricultural commodities.

Deputy Secretary Norton is a farmer and businessman from the West. His companies have extensive holdings in Arizona, California, New Mexico, and Nevada. He produces and markets lettuce, cotton, small fruits, citrus, and livestock. Mr. Norton has replaced Richard E. Lyng, who left USDA earlier this year.

CIVEROLO RECEIVES USDA HONOR AWARD

Edwin L. Civerolo, Research Plant Pathologist, Fruit Laboratory, HSI, was given a Superior Service Award by USDA Secretary John Block at the Department Honor Awards Ceremony in June. Dr. Civerolo was cited for his service in identifying the cause of citrus canker disease in Florida and Mexico and for providing the scientific research needed for regulatory actions.

Dr. Civerolo's research anticipated the outbreak of such a bacterial disease years before it happened. He adapted the sophisticated Enzyme-Linked Immunosorbent Assay, the membrane lipid identification technique and the plasmid identification method, to rapidly detect and identify the causative bacteria. He also gathered information on the causative agent of citrus canker disease in countries where this disease is normally found. His expertise was crucial in responding to the threat to the U.S. citrus industry. When the outbreak did occur in Mexico and subsequently in Florida, Dr. Civerolo was able to assist U.S. authorities and the Mexican government effectively. His work helped prevent the spread of that devastating disease.

Dr. Civerolo's findings are documented by 43 scientific publications. He has been chosen Chairman of the next International Conference on Plant Pathogenic Bacteria. He is widely known as a creative and innovative researcher who is at the forefront of bacteriologic science.

DUBEY LAUDED BY PARASITOLOGISTS

Jitender P. Dubey, Research Microbiologist, Protozoan Diseases Laboratory, API, was saluted by his peers recently for his outstanding contributions to the advancement of veterinary parasitology.

At the 30th Annual Meeting of the American Association of Veterinary Parasitologists, Dr. Dubey was presented their first Distinguished Veterinary Parasitologist Award. Dr. Dubey was recognized for his service as a teacher, a supporter of the veterinary community through assistance to farmers, diagnosticians, and researchers, and as a researcher who has pioneered studies on Toxoplasma and related organisms in food animals. He has contributed nearly 200 publications to scientific journals.

RESEARCH PROGRESS

Insect resistance in potatoes - The Colorado potato beetle is becoming increasingly difficult to control because the insect has developed tolerance to most of the available pesticides. Integrated pest management programs that include resistant cultivars are needed to regain control over this major pest of potatoes and tomatoes. Resistant species are known, but the resistance is caused by toxic glycoalkaloids that make tubers inedible.

Scientists in the Vegetable Laboratory, HSI, have discovered a wild species that synthesize high levels of a beetle feeding deterrent in their foliage but do not contain the toxic compound in their tubers. The scientists (S. L. Sinden, L. S. Sanford, and K. L. Deahl) also found evidence that a rare gene(s) may control the synthesis of the potent insect deterrent. The new knowledge relating the chemistry and genetics of the species to its resistance should lead to the identification and transfer of specific genes for insect resistance into potatoes. Since the toxic compound is not synthesized in tubers, the plants discovered in the study may prove useful in breeding resistant cultivars for commercial potato production.

The genetics of spiroplasmas - Spiroplasmas are unique disease-causing microbes that cause damage to agriculturally important crop plants and insects in many parts of the world. One of the characteristics of spiroplasmas is that they carry and are attacked by viruses. Investigation of these viruses is an avenue for understanding what factors may determine host range and pathogenicity of spiroplasmas and finding ways to introduce recombinant genes into spiroplasmas to understand their genetics.

Sally McCammon and Robert Davis, Plant Virology Laboratory, PPI, have found and characterized a new virus that attacks and may influence pathogenicity of some spiroplasmas. They have isolated the nucleic acid (DNA) from this virus and have utilized this DNA to develop means to introduce isolation DNA into spiroplasmas. This important step has overcome an obstacle in the way of introducing specific foreign genes into spiroplasmas. It opens the way for comprehensive investigations of the genetics of spiroplasmas through recombinant DNA technology and molecular cloning.

Linkages between nitrogen nutrition and aluminum tolerance in wheat plants - Aluminum toxicity may be the most important growth-limiting factor for plants growing in acid soils. Crop species differ widely in their tolerance to aluminum stress. In some species, a wide range of Al tolerance exists among cultivars, providing a valuable opportunity to study the mechanisms of Al tolerance. Aluminum-tolerant cultivars of wheat appear to escape or reduce aluminum injury by maintaining a relatively high pH in the microenvironment around their roots (rhizosphere). Plants which maintain a high rhizosphere pH reduce the solubility and, hence, toxicity of aluminum.

The form of nitrogen supplied to plants is known to affect plant-induced pH of the rhizosphere, but little is known about the differences between cultivars in preference for ammonium-nitrogen or nitrate-nitrogen when both sources are available for plant uptake. Charles Foy and Gregory Taylor, Plant Stress Laboratory, PPHI, recently discovered that aluminum-tolerant cultivars of wheat maintained a higher rhizosphere pH than aluminum-sensitive cultivars by sustaining a more rapid accumulation of nitrate-nitrogen and a less rapid accumulation of ammonium-nitrogen for their nitrogen requirements. Thus, their work has established a link between the nitrogen nutrition of wheat cultivars and their tolerance to aluminum.

Suppressing the germination of weed seeds in soils - Methyl isothiocyanate (MIT) is the toxic degradation product of the soil fumigant metham. Isothiocyanates are also natural products in many plant species which may have weed suppressive activity. Unlike most herbicides which are not active against all weed seeds in soils (but only against the small fraction of seeds which germinate and grow each year), MIT appears to have the capacity to kill weed seeds directly. There has been no reported research to date which has investigated the direct effect of MIT on seed germination.

John Teasdale and Ray Taylorson, Weed Science Laboratory, AEQI, recently made some very significant observations on the response of weed seed to MIT. They have demonstrated the dose of MIT which is required for consistent inhibition of weed seed germination and the physiological factors which can influence weed seed response to MIT. This information should provide a basis for rational use of MIT for the long-term management of weed seed populations in soil as well as for weed control in any given year. Their findings have been submitted for publication in Weed Science

Snowmelt-runoff models evaluated on an international scale - Albert Rango, Research Leader, Hydrology Laboratory, PPHI, noted recently that for the past several spring seasons, predictions of snowmelt runoff in portions of the western U.S. have been considerably in error. Methodology using remote sensing and hydrological modeling technology has been developed to try to improve forecast accuracy and thus improve water management for water supply, irrigation, and hydropower applications.

A Snowmelt-Runoff Model (SRM), which requires direct input of satellite snow cover data, was developed, and an international test of SRM and 10 other conventional runoff models was conducted on six international basins by the World Meteorological Organization. Dr. Rango reports that the results on these basins indicate that SRM can accurately simulate daily and seasonal snowmelt runoff, and that SRM works as well on foreign basins as on previously tested U.S. basins. In the recent test, SRM performance continued above the acceptable level even when the runoff data for the basins were not known, indicating the potential for using the model for streamflow forecasting on both gaged and ungaged remote basins. Improved forecasts from SRM using remote sensing data should provide significant cost savings in mountain snow areas where agricultural water supplies originate.

Sugar intake and loss of chromium - About 25 percent of the typical American diet is sugar. Some people consume even higher levels. A high sugar intake has been associated with several degenerative diseases, including diabetes, although scientists are not certain why. One reason has been suggested by a

recent study at the Beltsville Human Nutrition Research Center. Results of research by Richard Anderson, Vitamin and Mineral Nutrition Laboratory, BHNRC, and colleagues at the University of Maryland indicate that sugar may contribute to the development of these diseases by stimulating the loss of chromium, a trace element that may already be in short supply in the typical American diet.

In the Beltsville study, effects of sugar intake on chromium excretion in 37 adults - 19 men and 18 women were determined. For 12 weeks, subjects consumed a nutritionally balanced diet. For another 6 weeks, they consumed the same basic diet, different only in the level of refined sugars. However, 35 percent of the calories in the second diet were derived from refined sugars. During both dietary periods, the investigators measured the amount of chromium excreted in the subjects' urine. Urinary chromium losses of 27 of the 37 research participants increased from 10 to 300 percent simply by switching to a sugar rich diet. Chromium levels in the two diets were identical; therefore, decreased chromium consumption was not responsible for the effect. This work demonstrates that diets high in simple sugars stimulate chromium loss. This loss coupled with what could already be marginal intakes of chromium might produce a chromium deficiency in the body, possibly leading to diabetes or heart and blood vessel disease.

VISITING SCIENTISTS

Dr. Salah Elnagar, Cairo University, Giza, Egypt, spent June and July at the Insect Pathology Laboratory, PPI. Dr. Elnagar is an Associate Professor in the Department of Economic Entomology and Pesticides, and his research is on the use of baculovirus for the control of the Egyptian cotton leafworm. During his stay in Beltsville, he collaborated with Dr. George Tompkins in studies to determine possible alterations in the baculovirus from Egypt when it is used to infect pests of U.S. agriculture. Dr. Elnagar received a grant from the Fulbright Commission to support his visit to the United States.

Wu Wen-jun, Research Scientist, Department of Plant Protection, Northwestern College of Agriculture, Wugong, Shaanxi, People's Republic of China (PRC), is working with Martin Jacobson of the Insect Chemical Ecology Laboratory, AEQI, on the isolation, identification, and biological evaluation of insect antifeedants and toxicants present in the roots of the Chinese bittersweet plant, Celastrus angulata. Mr. Wu's 1-year assignment at Beltsville is sponsored by the PRC Ministry of Agriculture, Animal Husbandry, and Fishery.

Dr. Michael M. Brown, Chairman, Department of Biology, Western Maryland College, Westminster, Maryland, is a visiting scientist in the Pesticide Degradation Laboratory, AEQI, this summer. Dr. Brown is working with Dr. Jeffrey Karn on a project to construct expression vectors with multiple cloning sites downstream of a promoter that can be used for expressing cloned pesticide degrading genes.

Dr. Carlo Pascucci, Agrochemical and Residues Section, Joint Food and Agriculture Organization/International Atomic Energy Agency, Vienna, Austria, is spending 3 months in the Pesticide Degradation Laboratory, AEQI. Dr. Pascucci is working with Dr. Allan R. Isensee on the bioavailability of carbofuran in aquatic microecosystems using controlled release formulation.

Dr. Seif Gad El-Hak, from El-Minia University in Egypt, is a visiting scientist in the Vegetable Laboratory, HSI. He is working with Dr. Thomas H. Barksdale on disease resistance in tomatoes and cowpeas and the development of isozyme markers for nematode resistance. An Egyptian TV crew visited the Vegetable Laboratory in July, interviewed Dr. El-Hak, and took pictures of some of the research projects in the laboratory and greenhouse.

EMPLOYEE ACTIVITIES

A. M. Golden, Nematology Laboratory, PPI, has been selected as a Fellow of the Society of Nematologists. He has over 140 publications and has made numerous contributions to the knowledge of nematology. In addition to describing many new genera and species of plant parasitic nematodes, he has provided nematode identification for many colleagues and agencies for research, control, and regulatory purposes. Dr. Golden has served several professional societies in a leadership capacity and received the "1982 International Honor Award" for his significant contributions to the development, conduct, and evaluation of programs directed by the Office of International Cooperation and Development.

T. E. Devine, Nitrogen Fixation and Soybean Genetics Laboratory, PPHI, has been appointed Associate Editor of Crop Science.

Marie L. Farr, Mycology Laboratory, PPI, was appointed to a 5-year term on the Editorial Board of *Flora Neotropica*, a long-term UNESCO sponsored project to produce monographs of all plants growing spontaneously in the Americas between the tropics of Cancer and Capricorn.

Philip C. Kearney, Pesticide Degradation Laboratory, AEQI, received a Certificate of Appreciation from USDA's Animal and Plant Health Inspection Service (APHIS) for his outstanding professional leadership demonstrated during the review of an APHIS laboratory in Gulfport, Mississippi. Dr. Kearney chaired the review team which made a number of recommendations essential to the future of the APHIS laboratory.

Frank S. Santamour, Jr., Research Geneticist at the U.S. National Arboretum, was honored on May 2, 1985, as a "Distinguished Alumnus" at the annual awards banquet of the Department of Forestry and Wildlife Management of the University of Massachusetts in Amherst. He presented the banquet address on "The future of urban forestry" to more than 100 faculty and students. Dr. Santamour received his B.S. (cum laude) in Forestry in 1953.

RESEARCH PERSONNEL EVALUATION

ARS pioneered the development of special procedures for evaluating research scientists in the 1950's. This system provides an equitable standard for rewarding scientists based upon their knowledge, creativity, and demonstrated scientific achievements.

The Research Personnel Evaluation System (RPES) used in ARS is a good system. As with any system, however, opportunities often exist to make improvements. With this purpose in mind, the Agency is establishing an Advisory Committee for the RPES. The purpose of the Advisory Committee is to provide a research

program/scientist perspective in making recommendations to the ARS Administrator regarding RPES policies and procedural changes. Several issues require study, including for example, giving proper credit for research leadership and technology transfer activities.

Edwin T. Engman, Research Hydrologist, Hydrology Laboratory, PPHI, has agreed to serve on this Advisory Committee from the Beltsville Area. I am sure he will welcome any advice and comments you may wish to share on how the RPES can be improved or made to work more effectively.

AWARDS

Cash

George E. Meyers, Tractor Operator, Farm Management Branch, DO, (Outstanding performance of assigned duties in the Research Plots Section of the Farm Management Branch.)

George A. Hobbs, Engineering Equipment Operator Foreman, DO, (Outstanding performance of assigned duties in the Roads and Grounds Section of the Farm Management Branch.)

Charles W. Rogers, Tractor Operator Foreman, DO, (Outstanding performance of assigned duties in the Research Plots Section of the Farm Management Branch.)

Ellen V. Gilligan, Secretary, Protozoan Diseases Laboratory, API, (For facilitating the reorganization and expansion of the Protozoan Diseases Lab by innovative and dedicated performance of administrative activities that enhanced productivity of the Lab.)

Amelia H. Risdon, Secretary, Nitrogen Fixation and Soybean Genetics Laboratory, PPHI, (For outstanding performance exhibited after the retirement of the Water Data Laboratory Chief and the subsequent merger with the Hydrology Laboratory.)

Harriett Kilby, Secretary, PPHI, (For conscientious, dedicated administrative support to the Plant Physiology Institute.)

Jonathan Nevitt, Biological Aid, Insect Reproduction Lab, AEQI, (For performance substantially beyond expectations in management of our insect colony and performance of JH Esterase assays.)

Donna M. Brocht, Biological Laboratory Technician, Nonruminant Animal Nutrition Lab, ASI, (For assisting fellow technicians in learning computer skills and providing computer technical assistance to laboratory scientists.)

Betty J. Sieftring, Agricultural Research Technician, Field Crops Lab, PGGI, (For outstanding performance of hand emasculation crosses of alfalfa species and the execution of embryo tissue culture techniques.)

Jeffrey R. Aldrich, Research Entomologist, Insect Physiology Lab, PPI, (Initial invention award for U.S. Patent Application Serial No. 681,394, Title: Synthetic pheromones for the spined soldier bug, Podisus maculiventris.)

Kevin P. Conrad, Biological Aid, U.S. National Arboretum, (For outstanding performance during the absence of his supervisor and the emergency absence of his coworker.)

James Burrell, Painting Worker, U.S. National Arboretum, (For outstanding performance, effective execution of daily tasks and special projects.)

Georgia L. Smith, Accounting Technician, U.S. National Arboretum, (For outstanding performance, excellent, efficient, and prompt execution of the duties of accounting technician during a prolonged vacancy period.)

Merit Pay

Katsuto Ono, Research Chemist, Meat Science Research Lab, ASI

Bradford W. Berry, Research Food Technologist, Meat Science Research Lab, ASI

H. W. Hawk, Supervisory Research Physiologist, Reproduction Lab, ASI

Anthony W. Kotula, Supervisory Research Food Technologist, Meat Science Research Lab, ASI

Group Awards

Protozoan Diseases Lab, API - Avian Coccidiosis Project - (For development of the first genetically engineered antigen conferring immunity against coccidiosis of poultry.)

Patricia Augustine, Microbiologist

Lourdes Carson, Biological Laboratory Technician

Lawrence Spriggs, Biological Laboratory Technician

Harry Danforth, Microbiologist

Diane Adger, Biological Laboratory Technician

Grounds Maintenance Section, Facilities Management Unit, U.S. National Arboretum, (For outstanding performance, effective execution of daily tasks, special projects, and handling emergencies as a unit.)

Thurman Jerome Dade, Jr., Maintenance Foreman

James C. Barnes, Equipment Operator

Francis Boston, Motor Vehicle Operator

Russell D. Gaines, Gardener

Clarence L. Henderson, Gardener, Leader

Walter Lee Jordan, Jr., Motor Vehicle Operator

Andrew J. Littlejohn, Tractor Operator

Mervin R. Parker, Mechanic

James A. Rogers, Gardener

United States Department of Agriculture
 Agricultural Research Service
 Beltsville Area
 Beltsville, Maryland 20705

Construction/Repair Section, Facilities Management Unit, U.S. National Arboretum, (For outstanding performance, effective execution of daily tasks, special projects, and handling emergencies as a unit.)

Loring I. Benedict, Jr., Gardener Foreman
 Samuel B. Adams, Jr., Gardener
 Daltry Armston, Jr., Tractor Operator
 Clarence M. Baker, Gardener
 Harold E. Basey, Gardener
 Andrew Ford, Gardener
 Ogden R. Long, Laborer
 Junior A. Peterson, Painting Helper
 James B. Warfel, Laborer
 Robert E. Woodard, Gardener

September 1980

Quality Increase

Ella F. Greene, Chemist, Nutrient Composition Lab., BHNRC, (For continual superior performance in contributions to development of method and analysis of food for inorganic nutrients.)

Maryann F. Loftus, Agricultural Research Technician, Germplasm Resources Lab, PGGI, (For providing sustained superior technical support to the pathology research and the revision of Agricultural Handbook 16 and for carrying the programs forward in the absence of the lead scientist.)

Waldemar Klassen

WALDEMAR KLASSEN

Director

Beltsville Area

Dr. Klassen is a native of Minnesota. She received her undergraduate degree from the University of Arizona, and completed her graduate studies at the University of Illinois. Before joining ARS in 1979, Dr. Klassen was a member of the faculty at Pennsylvania State University. She has published numerous and published extensively on financial management and economic conditions affecting family economic well-being.

SYSTEMATIC ENTOMOLOGY RECEIVES NEW LEADER

Dr. Joseph E. Miller has been appointed as the new Research Leader of the Systematic Entomology Laboratory, ARS.



United States
Department of
Agriculture

Agricultural
Research
Service

Beltsville Area
Director's Office

Beltsville, Maryland
20705

NOTES FROM THE DIRECTOR

No. 164

September 1985

DEPUTY ASSISTANT SECRETARY

Daniel G. McPherson of Long Lake, Minnesota, has been named Deputy Assistant Secretary for Science and Education by Assistant Secretary Orville G. Bentley.

He has an outstanding record of performance in the private sector. In 1949 Mr. McPherson began working for General Mills, Inc. as a chemist. Advancing through the company, he served as a laboratory research technician, laboratory manager, and quality control manager in several General Mills plants before transferring to the company's headquarters in Minneapolis in 1961, where he was appointed quality control director. In 1969 he was elected vice president in charge of product safety and nutritional policy, a post he held until his retirement in 1981.

Mr. McPherson is a past president of the American Association of Cereal Chemists and received the Geddes Memorial Award for outstanding service to the association. He is a member of the American Association for the Advancement of Science, the American Chemical Society, the American Society for Quality Control, and the Institute of Food Technologists. He served as chairman of the Technical Committee of the Grocery Manufacturers of America, as a member of the Board of Governors, and as a member of the Industry Advisory Council to the Food and Nutrition Board of the National Advisory Council.

Mr. McPherson earned his B.S. degree from the University of Nebraska in chemistry and completed the Advanced Management Program at Harvard University.

NEW LEADER FOR FAMILY ECONOMICS RESEARCH

Colien J. Hefferan is the new Leader of the Family Economics Research Group. She replaces Katherine Tippet, who took a new position with USDA in Hyattsville earlier this year. The mission of this group is to develop new information and principles that can be used to improve the economic viability of families in American society.

Dr. Hefferan is a native of Minnesota. She received her undergraduate degree from the University of Arizona, and completed her graduate training at the University of Illinois. Before joining ARS in 1979, Dr. Hefferan was a member of the faculty at Pennsylvania State University. She has conducted research and published extensively on financial management and economic conditions affecting family economic well-being.

SYSTEMATIC ENTOMOLOGY RECEIVES NEW LEADER

Douglass R. Miller has been appointed as the new Research Leader of the Systematic Entomology Laboratory, IIBIII.

Dr. Miller is a native of California. He received his undergraduate and graduate training at the University of California, Davis. He came to work at Beltsville in 1969 as a research entomologist and specializes in the systematics of scale insects and mealybugs.

Dr. Miller will continue the strong tradition of effective and responsive leadership of one of the finest systematic entomology units in the world. The laboratory has 26 research scientists and a total staff of 43. Most of the employees work in the Museum of Natural History at the Smithsonian in Washington, D.C. However, Dr. Miller will have his office in Building 003 at Beltsville, close to his research laboratory in the basement of Building 004.

COMPETITIVE RESEARCH GRANTS

ARS scientists were recently awarded over \$1.5 million in competitive research grants by the Office of Grants and Program Systems in USDA. Four grants totaling almost \$440,000 were awarded to scientists at Beltsville:

<u>Scientist</u>	<u>Amount</u>	<u>Title and Description</u>
C. J. Baker Plant Pathology Lab PPI	\$ 90,000	The molecular and genetics basis for disease resistance in plants
R. A. Owens Plant Virology Lab PPI	120,000	Mechanisms of plant viroid replication and viroid-host interaction
J. D. Cohen Plant Hormone Lab PPHI	83,000	Characterization and developmental study of a peptide conjugate of IAA from <u>Phaseolus</u>
J. K. Lunney Helminthic Diseases Lab API	146,500	Enhancement of disease resistance in genetically engineered swine

The latter project is cooperative with Vernon G. Pursel and Robert J. Wall, Reproduction Laboratory, ASI. Eighteen grants were awarded to ARS scientists nationwide, with the average award being \$87,000.

In an earlier announcement, B. F. Matthews, Tissue Culture and Molecular Biology Laboratory, PPHI, was awarded a FY 85 grant of \$55,000 for research on the cloning and expression of genes involved in amino acid biosynthesis. We have also been advised that J. M. Kaper and C. W. Collmer, Plant Virology Laboratory, PPI, will receive a \$130,000 grant for their work on the structure and biological function of the cucumoviral satellite.

PUBLIC/PRIVATE SECTOR COOPERATION

The ARS Helminthic Diseases Laboratory, API, has initiated collaborative efforts with three commercial firms for the characterization and evaluation of diagnostic antigens for swine trichinosis. As a result of selection by

competitive application, Abbott Laboratories, North Chicago, IL; Idetek, Inc., San Bruno, CA; and Integrated Genetics, Framingham MA, will enter into Memoranda of Understanding with ARS. Cooperating ARS scientists are Drs. H. R. Gamble and K. D. Murrell.

Projected benefits for industry cooperators and the U.S. Pork Industry include the development of a commercial sero-diagnostic test for swine trichinosis, using antigens developed by ARS. Benefits to ARS will include physical-chemical characterization of these antigens supporting projects on development of a swine vaccine, genetic engineering of parasite antigens, and the genetics of disease resistance.

RESEARCH PROGRESS

Protozoan parasite can now be cultured in vitro - Protozoan parasites of the genus Sarcocystis cause weight loss, anorexia, low feed-weight efficiency, abortion, weakness, and death in cattle, sheep, goats, and pigs. Some species of Sarcocystis from pigs and cattle are infectious to human beings. Illness in livestock occurs mainly during the phase of development of the parasite in blood vessels. Scientists in the Animal Parasitology Institute and at Montana State University have recently succeeded in growing the vascular phase of this parasite in bovine endothelial cells and bovine monocytes in vitro. The ability to grow this stage in vitro can now be used to help elucidate heretofore unexplained pathogenic and immunological mechanisms associated with infection by Sarcocystis spp.

Landmark research publication on ladybird beetles - Ladybird beetles are important predators of many agricultural pests including scale insects, aphids, and mites. They frequently are introduced into U.S. agroecosystems as biological control agents and are responsible for major economic savings. The identity of many species has been difficult or impossible to ascertain. To solve this problem, R. D. Gordon, Systematic Entomology Laboratory, IIBIII, spent approximately 10 years studying the morphology of the 475 species in North America to find characters that could be used to identify them. In many instances this required the discovery and critical analysis of new character systems.

Results of the research were recently published in a 900-page manual entitled, "The Coccinellidae of America north of Mexico," by the New York Entomological Society. It includes 2 magnificent color plates and over 700 figures including illustrations of important taxonomic characters, drawings of general appearance, and distribution maps. A special feature is a table summarizing the data on ladybird beetle introductions, both intentional and unintentional. This research will allow biological control specialists, economic entomologists, ecologists, and others to accurately identify ladybird beetles without the aid of a specialist or reference to a large collection.

Tenderness and quality characteristics of beef - Current economic conditions have caused beef producers to become more aware of the importance of maximizing production efficiency, with the ultimate goal being to produce quality lean meat at the least possible cost. There is considerable interest in the use of young intact males (bulls) in modern beef production systems. Such interest stems from the fact that bulls gain weight more rapidly, utilize

feed more efficiently, and produce higher yielding carcasses with less fat and more red meat than steers and heifers. However, meat production from intact males has often encountered strong resistance from packers, since bulls have been shown to produce carcasses which are less tender, and have lower quality grades, darker lean color, and coarser textured lean.

Morse B. Solomon, Meat Science Research Laboratory, ASI, and colleagues at the University of Florida recently completed a study of the effects of breed, slaughter weight, and carcass electrical stimulation on the quality and palatability of beef from young bulls. Their results indicate that even though meat from bulls slaughtered at light carcass weights is generally tough and unacceptable, it substantially improved when bulls are fed to heavier slaughter weight while still maintaining a young age. Furthermore, meat tenderness and lean color problems can be either eliminated or reduced by stimulating the carcass electrically after slaughter.

New nutritional data on poultry products - Poultry products are an important component of the American diet. A 1976 National Food Consumption Survey revealed that 39 percent of those surveyed ate chicken at least once every 3 days. The National Broiler Council reports that 15.5 percent of the broilers go to fast-food restaurants to produce breaded or batter-coated fried parts.

To obtain accurate and updated nutrient composition data, scientists in the Nutrient Composition Laboratory, BHNRC, collaborated with other Federal agencies and a university to complete a nationwide sampling of "fast-food" fried chicken. Levels of starch (6-13%) found in this study were considerably higher than previously published data (2%), and the moisture contents (38-48%) consistently lower than earlier data. With one exception, light cuts have lower moisture and higher starch contents than the dark cuts of the same recipe from the same chain. These data will permit health professionals to more accurately assess total dietary intake of nutrients for individuals and populations.

EMPLOYEE ACTIVITY

Miklos Faust, Research Leader of the Fruit Laboratory, HSI, was elected as Vice President of the American Society of Horticultural Science for the International Division. The ASHS has 5,000 members and five divisions. Each division is headed by a Vice President. The Society has over 1,000 foreign members and many members are involved in foreign activities such as teaching, research, or consulting.

Dora K. Hayes, Research Leader of the Livestock Insects Laboratory, AEQI, was recently recognized by the Women's Action Taskforce with a special Women's Equality Award. Dr. Hayes was cited not only for her professional accomplishments in science, but also for her managerial achievements and dynamic leadership on issues involving affirmative action and equal employment opportunities.

Walter Mertz, Director of the Beltsville Human Nutrition Research Center, is a member of the Food and Nutrition Board (FNB) of the National Academy of Sciences. During the FNB Annual Retreat at the NAS Summer Studies Center in

Woods Hole, Massachusetts, Dr. Mertz was intensely involved in discussions on nutrition monitoring and assesement, uses of Recommended Dietary Allowances, nutrition and aging, and recent developments in nutrition research.

At the 30th Annual Meeting of the American Association of Veterinary Parasitologists held in Las Vegas in July, K. D. Murrell, Helminthic Diseases Laboratory, ASI, was elected President-elect. Dr. Murrell is the first non-veterinarian to be elected to this office.

George Steffens of the Fruit Laboratory, HSI, was elected Vice Chairman of the Plant Growth Regulator Society of America (PGRSA) at the 12th annual meeting held in Boulder, Colorado. Next year, he will automatically accede to the Office of Chairman. The PGRSA was started in 1973 by a small group of scientists interested in plant growth regulation with chemicals and held its first technical meeting in 1974. It now has over 600 regular members and 31 sustaining members. Plans have been made to hold a joint meeting with the Japanese Society of Chemical Regulation of Plants in Hawaii in 1987.

AWARDS

Cash

Debra Fravel, Research Plant Pathologist, Soilborne Diseases Laboratory, PPI, (Initial Invention Award for U.S. Patent Application Serial No. 713,733, entitled "Preparation of pellets containing fungi for control of soilborne diseases.)

Cynthia G. Hanna, Clerk-typist, Ruminant Nutrition Laboratory, ASI, (For exceptional service in assuming full responsibility for all phases of the operation of laboratory office during prolonged absence of laboratory secretary and performing duties in a timely and professional manner.)

Everett D. Burner, Agricultural Research Technician, Fruit Laboratory, HSI, (For excellent maintenance of the plant material in the small fruit breeding program.)

Vera M. Lee, Secretary, Systematic Entomology Laboratory, IIBIII, (Dedication above and beyond the call of duty to input and code the book on the lady beetles of America north of Mexico so that the manuscript could be published expeditiously and at considerable savings to the laboratory.)

Deborah M. Parrish, Clerk-typist, Beneficial Insect Introduction Laboratory, IIBIII, (Efficient performance of all laboratory duties while filling in as acting laboratory secretary.)

Mary A. Engelhaupt, Biological Laboratory Technician, Tobacco Laboratory, PGGI, (For outstanding assistance in administrative management of BARC Symposium X.)

Ann Gray, Biological Laboratory Technician, Tobacco Laboratory, PGGI, (For outstanding assistance in administrative management of BARC Symposium X.)

Sylvia Stephens, Secretary, Tobacco Laboratory, PGGI, (For outstanding assistance in administrative management of BARC Symposium X.)

Viola C. Matthews, Clerk-typist, Insect Chemical Ecology Laboratory, AEQI, (For sustained and meticulous performance in providing support for the scientific program of the Insect Chemical Ecology Laboratory.)

Susan A. Carter, Clerk-typist, Plant Stress Laboratory, PPHI, (For outstanding performance of secretarial duties in support of Beltsville Symposium X. Biotechnology for Solving Agricultural Problems.)

Doris A. Roberts, Secretary, Plant Protection Institute, (In recognition of sustained high quality administrative and secretarial support for the Plant Protection Institute and for the coordination of the institute's secretarial staff to respond efficiently to Beltsville Area programs with primary interest in conducting agricultural research.)

Mary Beth Donoghue, Clerk-typist, U.S. National Arboretum, (In recognition of her assistance to the National Arboretum Library and the Arboretum Plant Distribution Program.)

Susan L. Stanton, Biological Laboratory Technician, Field Crops Laboratory, PGGI, (For the discovery and documentation of a previously undescribed eriophyid mite as the causal agent of chlorotic leaf roll injury in zoysiagrass.)

Aileen E. Lee, Secretary, Hydrology Laboratory, PPHI, (For outstanding performance in coordinating and supervising office functions during a period of 50% office personnel turnover while at the same time facilitating the merger of the Water Data and Hydrology Laboratories.)

Donna H. Peterman, Clerk-stenographer, Plant Stress Laboratory, PPHI, (For the continuous high quality clerical support to the Plant Stress Laboratory during the absence of the secretary.)

Richard A. Anderson, Research Chemist, Vitamin & Mineral Nutrition Laboratory, BHNRC, (In recognition of his competent leadership of the Vitamin and Mineral Nutrition Laboratory as Acting Research Leader, January-May 1985.)

Gusta M. Shawver, Secretary, Animal Science Institute, (For effectively performing secretarial and administrative assignments in the Animal Science Institute.)

Quality Increase

Suzanne M. Hubbard, Editorial Assistant, Animal Improvement Programs Laboratory, ASI, (For sustained superior performance as an editorial assistant at the Animal Improvement Programs Laboratory, with special emphasis on initiative taken in preparation and writing of factsheets and development of a logo for the "NCDHIP Handbook.")

Darla J. Higgs, Physical Science Technician, Nutrient Composition Laboratory, BHNRC, (For the development of automated robot procedures for the analysis of nutrients in foods.)

Mary G. Harris, Secretary, Beltsville Human Nutrition Research Center, (For maintaining the high standards of service to the members of BHNRC and taking on additional duties after the position of Administrative Officer was abolished.)

Grace A. Frazier, Secretary, Division of Operations, (For superior performance as Secretary to the Head, Division of Operations, Beltsville Agricultural Research Center.)

Bruce J. Parlman, Research Horticulturist, U.S. Plant Introduction Station, PGGI, (The incumbent has taken significant steps to improve importation, service activities associated with quarantined, vegetatively-propagated plant germplasm, and has significantly improved the plant introduction/quarantine system.)

Joan E. Fittro, Clerk-typist, Vegetable Laboratory, HSI, (For sustained excellence in her ability to assume responsibility and perform all of her major duties well above the acceptable level.)

Geoffrey B. White, Biological Laboratory Technician, Vegetable Laboratory, HSI, (In recognition of continued quality contributions to the entomological research of the Vegetable Laboratory.)

Team Award

Herbarium Computerization Team - (For completion of the computerization of label data on herbarium specimens of the most important groups of plant pathogenic fungi and for the highest productivity in this project over a sustained period of time.)

David Farr, Research Botanist
June R. McDaniels, Clerk-typist
Mary Jane Pohlmann, Clerk-typist
Dulcie A. Powell, Technical Information Specialist
Marge Richeson, Clerk-typist

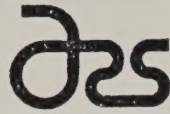
Suggestion Award

James C. Smith, Supervisory Research Chemist, Vitamin and Mineral Nutrition Research Laboratory, BHNRC, (Use imprest funds to pay honorariums to guest speakers.)

Waldemar Klassen
WALDEMAR KLASSEN
Director
Beltsville Area

Notes

From the Director



Agricultural
Research
Service

United States
Department of
Agriculture

Beltsville, Maryland

Robert Gilliland
Appointed CES
Director at
New Mexico
University

Dr. Robert L. Gilliland was appointed Director, Cooperative Extension Service, at New Mexico State University effective November 1, 1985. Dr. Gilliland received his undergraduate degree from the University of Arizona and graduate degrees from Arizona State University and Ohio State University. Since April, he has served as Acting Director, Cooperative Extension Service, New Mexico State University.

New Assignments
In Ag Programs
Staff

Effective October 28, 1985, Fred Woods will assume his new role in the area of agricultural public policy. Dixon Hubbard will serve as Acting Assistant Deputy Administrator while we conduct a national search to fill this position permanently.

Grant Shrum
30 Years with
National 4-H

Grant A. Shrum, President and Chief Executive Officer, celebrated his 30th anniversary with National 4-H Council, Tuesday, October 15th. A professional with 4-H for 35 years, he has served as President and CEO of National 4-H Council since 1982. Before the merger of the two private organizations serving 4-H at the national level, Shrum served as Executive Director of the National 4-H Foundation since 1955. A graduate of the University of Missouri, he was a county extension agent and a member of the 4-H staff in Missouri.

Training for
New Affirmative
Action
Coordinators

At the request of some States, the ES Equal Opportunity Staff will conduct an informal orientation/information civil rights training session for newly appointed State Cooperative Extension Service Affirmative Action Coordinators. The session will be held December 3-5, here, in the South Building.

Beth Walter Honadle
Joins Natural
Resources and
Rural Development
Staff

On October 27, Beth Walter Honadle joined the Natural Resources and Rural Development staff as National Program Leader for Economic Development. She will provide overall program leadership for Extension programs in economic development including area development, business and industrial development, downtown revitalization, small business management, labor development, impact assessment, and business retention and expansion.

AO-112-G
(11/85)



NOTES FROM THE DIRECTOR

No. 165

December 1985

PAAPE RECEIVES AREA SCIENTIST OF THE YEAR AWARD

Max J. Paape, Research Animal Scientist, Milk Secretion and Mastitis Laboratory, ASI, has been selected as the Scientist of the Year for the Beltsville Area. Dr. Paape will receive \$15,000 to supplement his research program and a plaque which cites his outstanding accomplishments in "defining the defensive role of leukocytes in the bovine mammary gland and developing new approaches to mastitis prevention in dairy cattle." Mastitis is one of the most important diseases in animal agriculture, causing economic losses of over \$2 billion per year to the U.S. dairy industry.

Dr. Paape has published over 190 scientific articles. His publications include both his major effort in the investigation of the role of polymorphonuclear neutrophils (PMN) or phagocytic cells as a defense mechanism against mastitis infections in the ruminant mammary gland and the effects of physiological stress on resistance to disease.

Dr. Paape's sustained research contributions have advanced both basic science and practical industry programs to control mastitis in dairy cattle. He is an internationally recognized leader in mastitis research who has extensive cooperation with U.S. universities and colleagues abroad.

RESEARCH PROGRESS

Irradiation for Eliminating Pork Parasites - The Food and Drug Administration has approved the irradiation of pork for eliminating the threat of trichinosis. This action was based on research carried out by K. D. Murrell and J. Baker of the Helminthic Diseases Laboratory, API, in collaboration with R. Brake of the Los Alamos National Laboratory in New Mexico. Studies proved that low dose gamma irradiation (50 kilorads) provided a wide safety margin. The FDA action is the first significant move to make irradiation available for practical use by the food industry.

In a second series of investigations, J. P. Dubey, Protozoan Diseases Laboratory, API, K. D. Murrell, and R. Brake have demonstrated that 50 kilorads of gamma irradiation is also sufficient to inactivate Toxoplasma gondii, another potential human pathogen sometimes found in pork. All of these studies were funded in part by the Department of Energy.

Gene Responsible for Pesticide Degradation Isolated - Scientists in the Pesticide Degradation Laboratory, AEQI, have successfully isolated the gene responsible for an enzyme that degrades a number of important organophosphate insecticides. Using a soil Flavobacterium sp. originally isolated in the Philippines, they have shown that the gene (called the opd gene) is on a plasmid or a circular piece of DNA not linked to the larger chromosomal DNA of the organism. The opd gene was cut out of the Flavobacterium DNA, and these fragments were inserted into a vector for transferring the gene. The recombinant DNA was then put into Escherichia coli and propagated.

NOTES FROM THE DIRECTOR

January 1953

No. 103

RESEARCH RECEIVES AREA SCIENTIST OF THE YEAR AWARD

Dr. J. P. Phipps, Research Animal Scientist, Milk Section and Bacteriology, has been selected as the scientist of the year for the Beltsville Area. Dr. Phipps will receive \$1,000 to supplement his present salary and to enable him to continue his research program on the bacteriology of the dairy animal. His research is one of the most important in the dairy industry, and his work has resulted in the development of a vaccine for the prevention of mastitis in dairy cattle. His research is one of the most important in the dairy industry, and his work has resulted in the development of a vaccine for the prevention of mastitis in dairy cattle.

Dr. Phipps has published over 100 scientific articles. His publications include work on the bacteriology of the dairy animal, the prevention of mastitis, and the development of a vaccine for the prevention of mastitis in dairy cattle. His research is one of the most important in the dairy industry, and his work has resulted in the development of a vaccine for the prevention of mastitis in dairy cattle.

Dr. Phipps's research has been supported by the Agricultural Research Service, the Dairy Research Station, and the Beltsville Area. His research is one of the most important in the dairy industry, and his work has resulted in the development of a vaccine for the prevention of mastitis in dairy cattle.

Research Program
The research program of Dr. Phipps is one of the most important in the dairy industry. It is a program of research on the bacteriology of the dairy animal, the prevention of mastitis, and the development of a vaccine for the prevention of mastitis in dairy cattle. His research is one of the most important in the dairy industry, and his work has resulted in the development of a vaccine for the prevention of mastitis in dairy cattle.

In a recent series of investigations, J. P. Phipps, Research Animal Scientist, has been selected as the scientist of the year for the Beltsville Area. Dr. Phipps will receive \$1,000 to supplement his present salary and to enable him to continue his research program on the bacteriology of the dairy animal. His research is one of the most important in the dairy industry, and his work has resulted in the development of a vaccine for the prevention of mastitis in dairy cattle.

Research Program
The research program of Dr. Phipps is one of the most important in the dairy industry. It is a program of research on the bacteriology of the dairy animal, the prevention of mastitis, and the development of a vaccine for the prevention of mastitis in dairy cattle. His research is one of the most important in the dairy industry, and his work has resulted in the development of a vaccine for the prevention of mastitis in dairy cattle.

Similar research has been in progress in Texas, using a Pseudomonas diminuta isolated in the United States to study the opd gene. BARC scientists developed a probe from the Texas organism by inserting a labeled phosphorous atom bonded to a nucleotide to determine whether the two genes are related. A hybridization technique was used where similar or homologous pieces of DNA bind together. When separated DNA fragments from Flavobacterium were exposed to the labeled probe from Texas organism, a match-up occurred between the DNA from both organisms. The two genes appear to be the same at a specific location on each plasmid. Subsequent mapping of the nucleotide sequences in the plasmids, using the restriction enzymes, revealed that the composition of the DNA fragments are different beyond the gene site.

The discovery of the similarity between genes from two organisms isolated from different geographic regions suggests that these genes for pesticide degradation came from a common source. It has important implications as to how genes move through the soil microbial population. PDL scientists believe these mobile genetic elements may be responsible for the origin of "problem soils" or enhanced pesticide metabolism in soils.

New Development in Fruit Tissue Culture Techniques - Propagation of self-rooted apple trees was not commercially feasible prior to the development of tissue culture methods. The first tissue culture developments required the use of an agar solidified medium and an extensive acclimation period after rooting to adapt the young plants to soil conditions. Scientists in the Fruit Laboratory, HSI, have now developed a simplified liquid medium that works well for nearly all apple cultivars and is more economical to use. This simplified medium uses only sucrose and auxin, and roots can be initiated in one week. The shoots are then transferred to small peat plugs to allow the roots to elongate and the shoot to start new growth. The young plants are then transplanted to larger containers in the greenhouse with no disturbance to the root system, thus resulting in easier handling procedures and higher rates of survival for the plants. Plants rooted in plugs in January, then planted to the field in June, have reached an average height of 1.2 m (3 1/2 ft) by the end of the growing season.

Scientists Seek to Reduce Piglet Losses - Twenty-five percent of piglets die before weaning, and most of this loss occurs during the first 3 days of life. Even transient deprivation of oxygen during birth may cause permanent damage to piglets, with more dying before 21 days postpartum compared to piglets not deprived of oxygen.

Parturition on weekends can be avoided entirely by using progestagens such as altrenogest or prostaglandin synthesis inhibitors such as meclofenamic acid to prevent early, unscheduled farrowings before an injection of prostaglandin to induce parturition. Experiments by H. D. Guthrie, Reproduction Laboratory, ASI, on the use of compounds such as relaxin, oxytocin, or anticholinesterases (which can coordinate uterine contractions or potentiate contractions) may allow scheduling of farrowing during regular working hours and reduce the actual time of the delivery process so that fewer piglets are injured and more can be manually assisted by an attendant.

If farmers can increase the number of piglets weaned/sow/year from 13 to 18 (an increase of 38%), the number of breeding animals, replacement gilts and boars could be decreased by a comparable amount without decreasing the number of market hogs produced per year.

Improving the Nutritional Composition of Poultry - In farm animals, excess carcass fat represents a waste of feed energy. Furthermore, consumer preference is for leaner meat. Scientists in the Nonruminant Animal Nutrition Laboratory, ASI, have been studying ways for improving feed efficiency in meat animals. A method of restricting nutrient intake at an early age in broiler chicks was developed, resulting in 8% less body fat at slaughter, improved feed efficiency (12%), and body weight gains. Since feed is the major cost item in animal production, any improvement in nutrient utilization by growing animals will be of utmost economic importance.

New Spiroplasmavirus Isolated and Characterized - Spiroplasmas are unique disease-causing microbes that cause damage to agriculturally important crop plants and insects in many parts of the world. One of the characteristics of spiroplasmas is that they carry and are attacked by viruses. Investigation of these viruses is an avenue for understanding problems in (a) learning what factors may determine host range and pathogenicity of spiroplasmas, and (b) finding ways to introduce recombinant genes into spiroplasmas to understand their genetics. Scientists in the Microbiology and Plant Pathology Laboratory, PPI, have found and characterized a new virus that attacks, and may influence pathogenicity of, some spiroplasmas. They have isolated the nucleic acid (DNA) from this virus and have utilized this DNA to develop means to introduce isolated DNA into spiroplasmas. This important step has overcome an obstacle in the way of introducing specific foreign genes into spiroplasmas. It opens the way for comprehensive investigations of the genetics of spiroplasmas through recombinant DNA technology and molecular cloning.

NEW RESEARCH SCIENTISTS

Joyce E. Loper, Research Microbiologist, recently joined the Soilborne Diseases Laboratory, PPI. Dr. Loper will study the molecular and genetic basis of bacterial antagonism against soilborne plant pathogens and population dynamics of antagonistic bacteria in the rhizosphere. Dr. Loper received a Ph.D. in 1983 at the University of California, Berkeley. Her thesis work focused on rhizosphere colonization and metabolite production of plant-associated Pseudomonads. She worked as a research biologist from September 1983 to 1985 with the Biotechnology Group of Chevron Chemical Company where she initiated research to identify bacteria strains which are effective in the biological control of soilborne plant pathogens.

Barbara Sue Mischke, Research Geneticist, has joined the Soilborne Diseases Laboratory, PPI, where she will develop a molecular genetics program to develop new biotypes of biocontrol fungi with enhanced biocontrol capabilities and other desirable characteristics by protoplast fusion and transformation and by cloning desirable genes of biocontrol fungi. Dr. Mischke received her Ph.D. degree from the University of Arizona, Tucson. After completing her Ph.D., she worked at the Ohio Wesleyan University on cell isolation and fractionation, enzymology, and chemiluminescence; at the University of California, Davis, on plasmid-encoded genes in plant pathogens; and at the Tissue Culture and Molecular Biology Laboratory, PPHI, Beltsville, where she designed equipment and performed research on protoplast electrofusion and transformation.

Frankie N. Schwenk, Family Economist, is a new scientist in the Family Economics Research Group. She will be responsible for research related to

child costs and develop new studies of household expenditure patterns. Dr. Schwenk received a Ph.D. in Agriculture and Extension Education at the University of Maryland. She has served on the faculty at several universities, including Iowa State where she taught for 10 years.

Daniel R. Shelton, Research Microbiologist, recently joined the Pesticide Degradation Laboratory, AEQI. Dr. Shelton's Ph.D. research was in soil microbiology at Michigan State University, and he spent 2 years as a postdoctorate researcher at the University of California at Riverside. Dr. Shelton will be working on the isolation and characterization of soil microorganisms responsible for degrading pesticides, metabolism of these compounds at the enzyme level, and cooperative research on the manipulation of genes to control the persistence or metabolism of pesticides.

RESEARCH GRANTS

Biocontrol of Soilborne Pathogens - George C. Papavizas and Deborah R. Fravel, Soilborne Diseases Laboratory, PPI, were awarded a \$220,000 grant by the Binational Agricultural Research and Development Fund (BARD) for research on the "Genetic improvement of Talaromyces flavus and its mechanisms of action on Verticillium." The grant is for 3 years. The major objective is to improve the efficacy of the biocontrol agent by genetic manipulation and determine the mechanism by which T. flavus reduces the ability of the pathogen to cause disease. The research will be done in cooperation with scientists at The Volcani Center and the Hebrew University in Israel.

New Floral Crops - The Florist and Nursery Crops Laboratory, HSI, is beginning the second year of a 5-year cooperative project with the Society of American Florists and the American Florists Endowment. The SAF-AFE is contributing \$50,000 per year with matching funds from the Agricultural Research Service for new floriculture crop development. This is part of a national program involving satellite research with 10 universities throughout the country.

EMPLOYEE ACTIVITIES

At the 74th Annual Meeting of the Poultry Science Association (PSA) held in Ames, Iowa, in August, H. C. Cecil, Avian Physiology Laboratory, ASI, was elected Second Vice President. In 2 years, Dr. Cecil will automatically become President of PSA.

Robert M. Faust was invited to organize and conduct a symposium on biotechnical advances in microbial and molecular genetics of entomopathogens and to present a paper on plasmid and gene transfer systems in entomocidal bacilli at the American Association for Advancement of Science (AAAS) meeting in Los Angeles. Following the AAAS meeting, he visited the Korean Advanced Institute of Science and Technology in Seoul and the Office of Rural Development, Suweon, Korea. Dr. Faust was elected as a member of the Biochemical Society of the Republic of Korea and the Korean Society for Applied Microbiology.

A. Morgan Golden, Nematology Laboratory, PPI, has received the 75th Anniversary Award of The Helminthological Society of Washington. He was presented this prestigious award for his many contributions to Parasitology and to the Society. He has served the Society as Recording Secretary, Vice-President, and President. He is President and on the Board of Trustees

of the Brayton H. Ransom Memorial Trust Fund of the Society and is a member of the editorial board. Dr. Golden is recognized worldwide for his contributions to nematology and is a Fellow of the Society of Nematologists.

Philip C. Kearney, Research Leader, Pesticide Degradation Laboratory, AEQI, has been elected President of the International Union of Pure and Applied Chemistry (IUPAC) Division of Applied Chemistry at the 33rd General Assembly Meeting in Lyon, France, in September. The Applied Chemistry Division is composed of six commissions on Food Chemistry, Oils and Fats, Pesticide Chemistry, Biotechnology, Atmospheric Chemistry, and Water Chemistry. Dr. Kearney's major responsibility will be to restructure and expand IUPAC's Commission on Biotechnology on an international basis. The term of the IUPAC presidency for Applied Chemistry is 4 years.

Walter Mertz, Director, Beltsville Human Nutrition Research Center, was invited to present two papers for the 7th Annual Meeting of Frontiers in Nutrition on Hilton Head Island, South Carolina, in September. His papers were entitled, "Laboratory tests for nutritional screening" and "Update on trace minerals for the clinician."

George C. Papavizas, Research Leader, Soilborne Diseases Laboratory, PPI, was invited to a symposium on August 5, 1985, organized by the Microbial Genetics Division, Pioneer Hi-Bred International. The symposium focused on agricultural microbiology today and the use of naturally occurring microorganisms. Guests attending the symposium were from 10 states and Canada and represented universities, government agencies, and private industry. Dr. Papavizas presented one of the four invited lectures entitled, "Biological control of soilborne plant pathogens: Opportunities and problems."

At ceremonies held at the Wellesley College Club in October, Frank S. Santamour, Jr., Research Geneticist at the U.S. National Arboretum, was presented the Jackson Dawson Medal by the Massachusetts Horticultural Society. This award is given "for skill in the science and practice of hybridization and propagation of hardy woody plants" and is one of the most prestigious in the horticultural community. Dr. Santamour was recognized for his work on the genetics, hybridization, creation, and selection of superior landscape trees.

VISITING SCIENTISTS

Helmut Erdmann is a visiting scientist in the Florist and Nursery Crops Laboratory working with Robert Griesbach. Dr. Erdmann received his Ph.D. in physiology and biochemistry from the Carolo-Wilhelmina Technical University, Braunschweig, West Germany. He is studying processes of cell differentiation.

Marek Wocial has joined the Florist and Nursery Crops Laboratory for 1 year to work on the tissue culture of new crops. Mr. Wocial received his Master's Degree from the University of Warsaw and has extensive experience in European commercial floriculture. Mr. Wocial will be working with Mark Roh.

Two scientists from the Institute for the Application Nuclear Energy in Agriculture and Medicine, Zemun, Yugoslavia, are working in the Helminthic Diseases Laboratory, API, as part of a scientific training and exchange program sponsored by the USDA's Office of International Cooperation and Development, International Research Division. Dr. L. Sofronic will be

studying methods for producing monoclonal antibodies under the supervision of H. R. Gamble. Ms. D. Ivanoska is working with J. Lunney on immunochemical aspects of swine histocompatibility antigens. In March 1986, both scientists will return to Yugoslavia to participate in a collaborative project on trichinosis directed by K. Cuperlovic (Zemun) and K. D. Murrell (Beltsville).

Sang-Soo Oh, Junior Research Scientist, Agricultural Science Institute, Rural Development Administration, Suweon, Korea, is spending 1 year in the Insect Pathology Laboratory, PPI. Sang-Soo Oh is working with Robert M. Faust on the development of gene libraries for the entomocidal protein toxins of Bacillus thuringiensis.

Naomi Kislev, of the Weizmann Institute of Science, Israel, is spending a year in the Insect Pathology Laboratory, PPI. Dr. Kislev is interested in the molecular engineering of the insect pathogenic baculoviruses. While in the United States, she will work with Edward Dougherty on the isolation and cloning of genes from the gypsy moth baculovirus.

Torbjorn Almlid, Scientist and Director of the Stensby Center for Swine Artificial Insemination, Norway, is a visiting scientist in the Reproduction Laboratory, ASI. Dr. Almlid is working with Larry Johnson on the cryopreservation of boar semen. Dr. Almlid's 1-year assignment at Beltsville is sponsored by the Norwegian Pig Breeders Association and the Norwegian Agricultural Research Council.

Kay Kim, Research Biochemist, is a visiting scientist in the Soilborne Diseases Laboratory, PPI. Dr. Kim is working with Deborah Fravel on a project to determine the biochemical basis of biological control of Verticillium by the soilborne fungus Talaromyces flavus. Dr. Kim received her Ph.D. degree in 1984 at the University of Maryland.

Naomichi Watanabe, Faculty of Agriculture, Meiji University, Tokyo, Japan, is spending 12 months in the Soilborne Diseases Laboratory where he is studying the influence of various fertilizers on the physiology and biological control capabilities of the fungi Trichoderma and Gliocladium. Mr. Watanabe is a lecturer at Meiji University and conducts research on bacterial diseases of crops and biological control of soilborne plant pathogens.

AWARDS

Cash

Roy L. Brocht, Equipment Operator, Farm Management Branch, DO, (Outstanding performance of assigned duties in the Research Plots Section of the Farm Management Branch.)

Jack A. Lewis, Research Soil Scientist, Soilborne Diseases Laboratory, PPI, (Initial Invention Award for U.S. Patent Application entitled "Preparation of pellets containing fungi and nutrient for control of soilborne plant pathogens.")

H. R. Hanes, Shipment Clerk, Germplasm Resources Laboratory, PGGI, (For sustained, efficient shipment of voluminous plant materials to foreign and U.S. locations.)

Julius Feldmesser, Zoologist, Nematology Laboratory, PPI, (Initial Invention Award for U.S. Patent Application Serial No. 637,241, title "Soil sampling apparatus.")

Sherry A. Cohen, Secretary, Insect Physiology Laboratory, PPI, (For sustained, superior performance in carrying out all aspects of her secretarial duties and in providing administrative support for the entire laboratory staff over an extended period of time.)

Robert T. Faltynski, Carpenter, U.S. National Arboretum, (For outstanding performance in applying superior techniques to create structures, signs and displays for research and educational programs and other duties relating to maintenance and safety.)

Willie Swift, Tractor Operator, U.S. National Arboretum, (For outstanding performance in applying superior mowing techniques to perform additional duties due to vacancy and to accept other duties outside of his position description.)

Stanley M. Sokolowski, Automotive Worker, U.S. National Arboretum, (For outstanding performance in providing mechanical support during the illness and absence of the head mechanic, WG-10, and other duties outside of this position description.)

George C. Papavizas, Research Plant Pathologist, Soilborne Diseases Laboratory, PPI, (Initial Invention Award for U.S. Patent Application entitled "Preparation of pellets containing fungi and nutrient for control of soilborne plant pathogens.")

John R. Hill, Tractor Operator, Farm Management Branch, DO, (Outstanding performance of assigned duties in the Research Plots Section of the Farm Management Branch.)

Charlotte M. Gallagher, Secretary, Farm Management Branch, DO, (Outstanding performance of assigned duties in the Office of Branch Chief, Farm Management Branch.)

R. J. Shivers, Tractor Operator, Farm Management Branch, DO, (Outstanding performance of assigned duties in the Research Plots Section of the Farm Management Branch.)

Quality Increase

Randy A. Rowland, Plant Physiologist, Plant Stress Laboratory, PPHI, (For sustained high performance and operational effectiveness in conducting experiments on the effect of environmental stress on seed development and germination.)

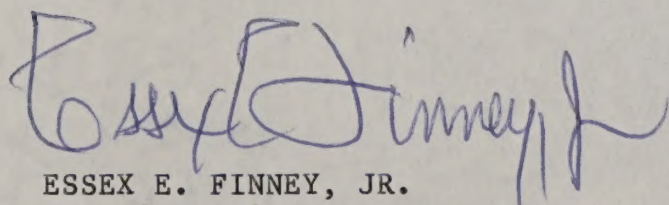
Mary Ann Canter, Laboratory Technician, Insect Reproduction Laboratory, AEQI, (Award for excellence in overall performance as a laboratory technician.)

FOREIGN VISITING SCIENTISTS

NAME	COUNTRY	DATES	Lab
M. Kamal U. Chowdhury	Bangladesh	12/84 - 3/86	TCMBL
David Ward	United Kingdom	6/84 - 5/86	PPL
Shekhar Nautiyal	Lucknow, India	9/85 - Indef.	NF&SGL
Ketan Shah	Ahmedabad, India	3/85 - Indef	NF&SGL
Magali Claire Dufour	France	3/85 - 12/85	FL
Jagdishwar Nath Bhargava	India	9/85 - 12/85	FL
Xiu-Ping Sun	PRC	10/85 - 10/86	FL
Augustin Ungurean	Romania	10/85 - 1/86	FL
Jong Gyu Woo	Rep. of Korea	9/85 - 8/86	VL
Helmut Erdmann	West Germany	9/85 - 9/86	FNCL
John Hammond	England	5/82 - 12/86	FNCL
Mark S. Roh	Korea	7/82 - 12/86	FNCL
Marek Wocial	Poland	9/85 - 9/86	FNCL
Ana Canals	Spain	6/85 - 12/85	HDL
Diana Ivanoska	Yugoslavia	10/85 - 4/86	HDL
H. P. Marti	Switzerland	9/84 - 9/86	HDL
Ljiljana Sofronic	Yugoslavia	10/85 - 4/86	HDL
Alan Johnson	Australia	3/85 - 5/86	PDL
Huw Hughes	England	2/85 - 2/87	PDL
Effat El-Sheshtawy	Egypt	10/85 - 4/87	PDL
Rosina Krecek	Rep. So. Africa	1/86 - 12/87	BPL&HDL
Theodor Ramp	Switzerland	1/86 - 12/87	HDL
Emmanuel Ojo-Amaize	Nigeria	10/85 - 9/86	MSML
A.E.F. Ahmed	Egypt	6/85 - 9/86	MSML
Torbjorn Almlid	Norway	9/85 - 9/86	RL
Ilan Kafri	Israel	8/85 - 2/87	NANL
Jean Simon	France	9/85 - 9/86	NANL
Naomichi Watanabe	Japan	3/85 - 3/86	SBDL
Thierry Candresse	France	2/85 - 4/84	PVL
Ati Duriat	Indonesia	8/85 - 1/86	PVL
Meghnad Konai	India	4/84 - 4/86	PVL
Luis Salazar	Peru	8/85 - 8/86	PVL
Sang-Soo Oh	Korea	9/85 - 9/86	IPL

EPILOGUE: No man, who continues to add something to the material, intellectual, and moral well being of the place in which he lives, is left long without proper reward.

-- Booker T. Washington



ESSEX E. FINNEY, JR.
Associate Director
Beltsville Area

